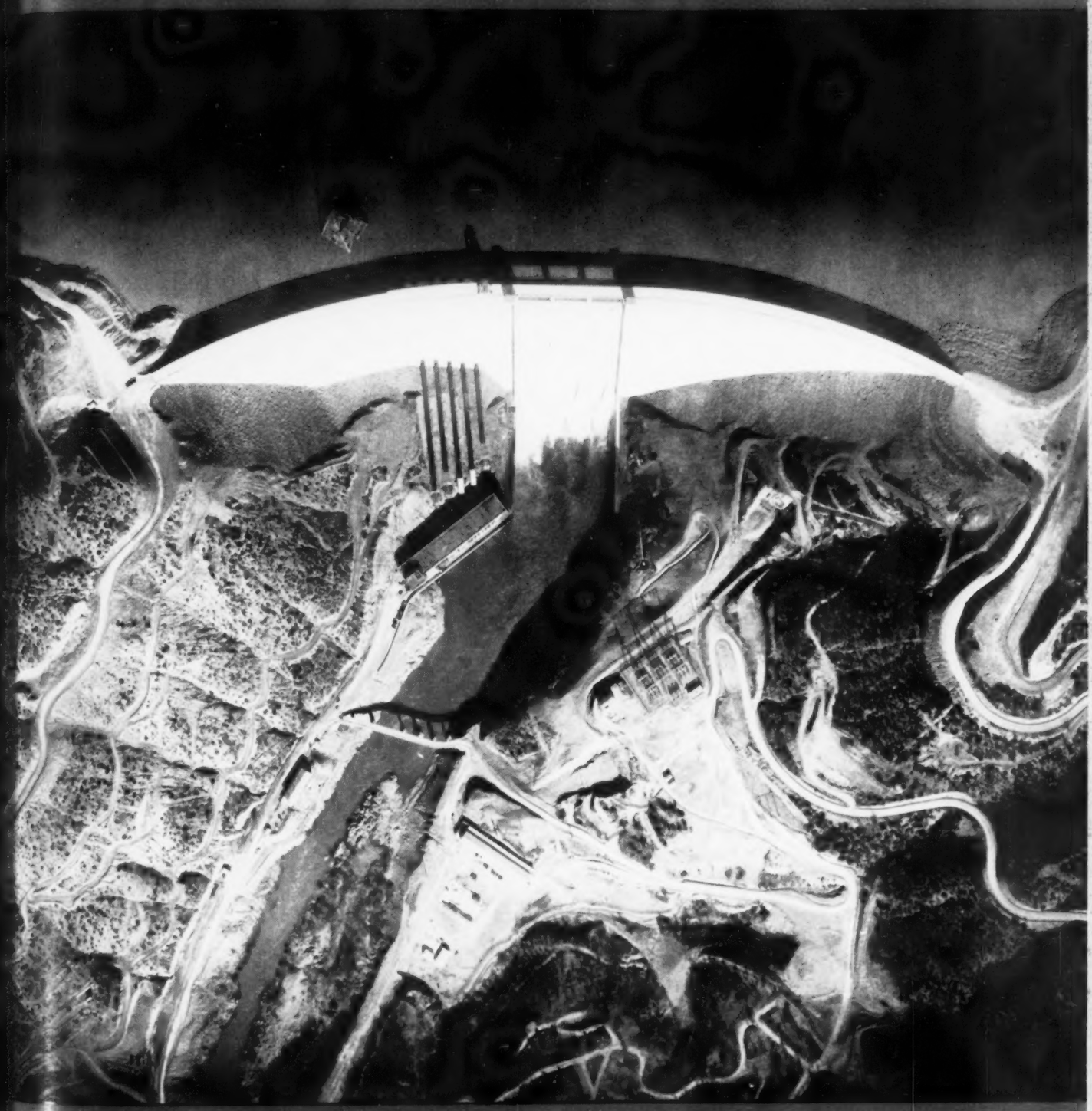
ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.



McGraw-Hill Co. of California

MAY 1946

25c a Copy

MODERN Electric FARMING
"HIRED HANDS" COME HOME
EGGS COOL QUICKLY, STAY FRESHER
A GOOD START IN LIFE
COLD THAT SAVES TIRES
MORE EGGS WITH WARM WATER
THEY MAY DIFFER ABOUT PUMPS...BUT NOT ABOUT POWER
Electric Pumping
MEANS MORE WATER FOR LESS MONEY

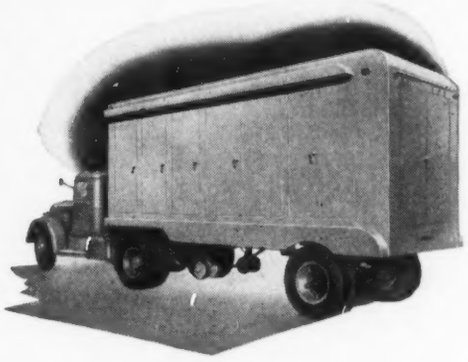
KEEPING CALIFORNIA FARMERS "Kilowatt-Conscious"

HALF A CENTURY AGO the Edison Company pioneered in promoting electric pumping for irrigating. That was the successful beginning of a campaign to electrify Southern and Central California farms. Today more than 92% of California farms use central station power, while the national average is less than 45%.

As these recent Edison advertisements from California farm papers show, Edison's efforts to increase use of electricity on the farm have never stopped. Every electrical appliance and farm equipment dealer in Edison territory benefits by this advertising, which keeps California's progressive farmers constantly interested in new ways to use electric power to save labor and cut production costs.

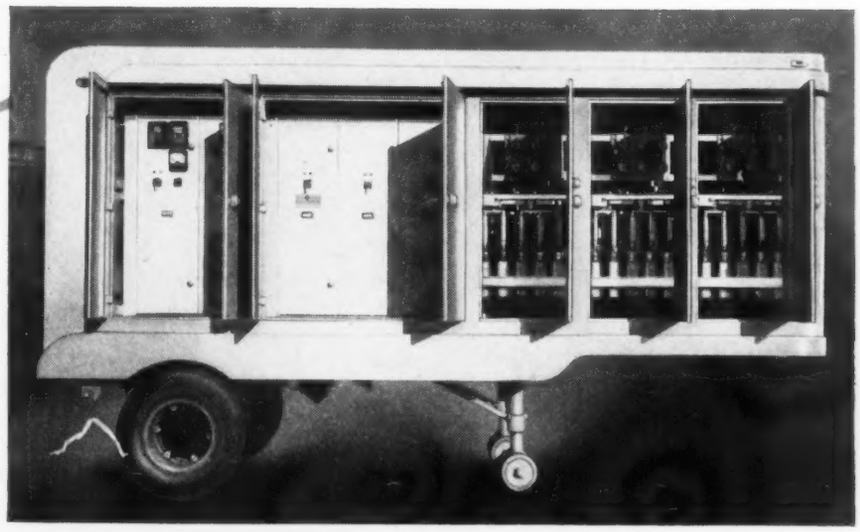
SOUTHERN CALIFORNIA EDISON COMPANY

ELECTRICAL WEST (with which is consolidated The Journal of Electricity), May, 1946. Vol. 96, No. 5. Published monthly by the McGraw-Hill Company of California, 68 Post Street, San Francisco, 4, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rates—U.S., U.S. Possessions and Latin American Republics: $2, 1 year; $3, 2 years; $4, 3 years. Canada: $2.50, 1 year; $4, 2 years; $5, 3 years. Other countries: $3, 1 year; $5, 2 years; $6, 3 years. Single copy, 25c. Copyright, 1946, McGraw-Hill Company of California. All rights reserved.



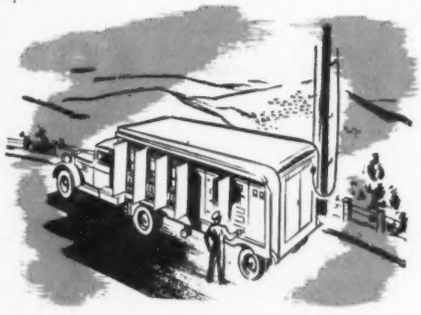
KILOVAR Canteen

New G-E Capacitor Trailer brings Kilovars Close to the Load!



With this capacitor-trailer, it is possible to pull up alongside the load and, with live-line clamps, connect in capacitors in sections of 180 kvar each to a total of 1080 kvar. The trailer is completely "self-contained" and includes one hand-operated magne-blast main breaker, and three magne-blast breakers which accomplish manual and automatic switching under load. Panel-mounted voltage and current meters are included for checking of capacitor results.

The equipment is rated 4160 volts, 3-phase wye, 60 cycles, 2400 volts delta. 72 individual capacitor units rated 15 kva, 2400 volts are arranged in racks. The use of highly stable, non-inflammable Pyranol capacitors together with magne-blast breakers eliminates the fire hazard. Built-in jacks enable quick leveling of the unit, and permit taking weight off tires if the unit is to stand for some time.



THIS new, complete, mobile capacitor equipment has recently been supplied by General Electric to the Consolidated Gas, Electric Light and Power Company of Baltimore.

The complete flexibility this unit affords will enable it to supply kilovars for emergency needs as well as to provide immediate voltage correction and power-factor improvement close to seasonal loads. In addition, its mobility permits it to be used as a capacitor laboratory on wheels for making full-scale tests on feeders to determine the needs for permanent capacitor installations.

So adaptable are capacitors in helping improve system load conditions that it is a logical step ahead for power companies to purchase equipments that can be moved from place to place. General Electric engineers will be glad to discuss with you the possible use of such equipment in your system. Write to *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

GENERAL ELECTRIC

407-106-5700

ELECTRICAL WEST

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Cover Photo: Aerial view of Shasta Dam made by a Bureau of Reclamation photographer from an altitude of 6,000 feet.

CHANGE OF ADDRESS

Circulation Manager,
Electrical West,
68 Post St.
San Francisco 4, Calif.

Please change my address

From .....

To .....

Signed .....

People

John Adams

whose basic breakdown of what makes a business run, titled *What Goes On?*—a dealers' study, appears in this month's Sales Guide, is with the domestic sales department of Southern California Edison Co. Just returned from four years service in the Navy, a lieutenant commander, Adams saw action in all the naval battles except one when on U. S. S. Intrepid, an aircraft carrier. His analysis of the activities of a business applies to either a one-man business or a big one.

A. B. Smedley

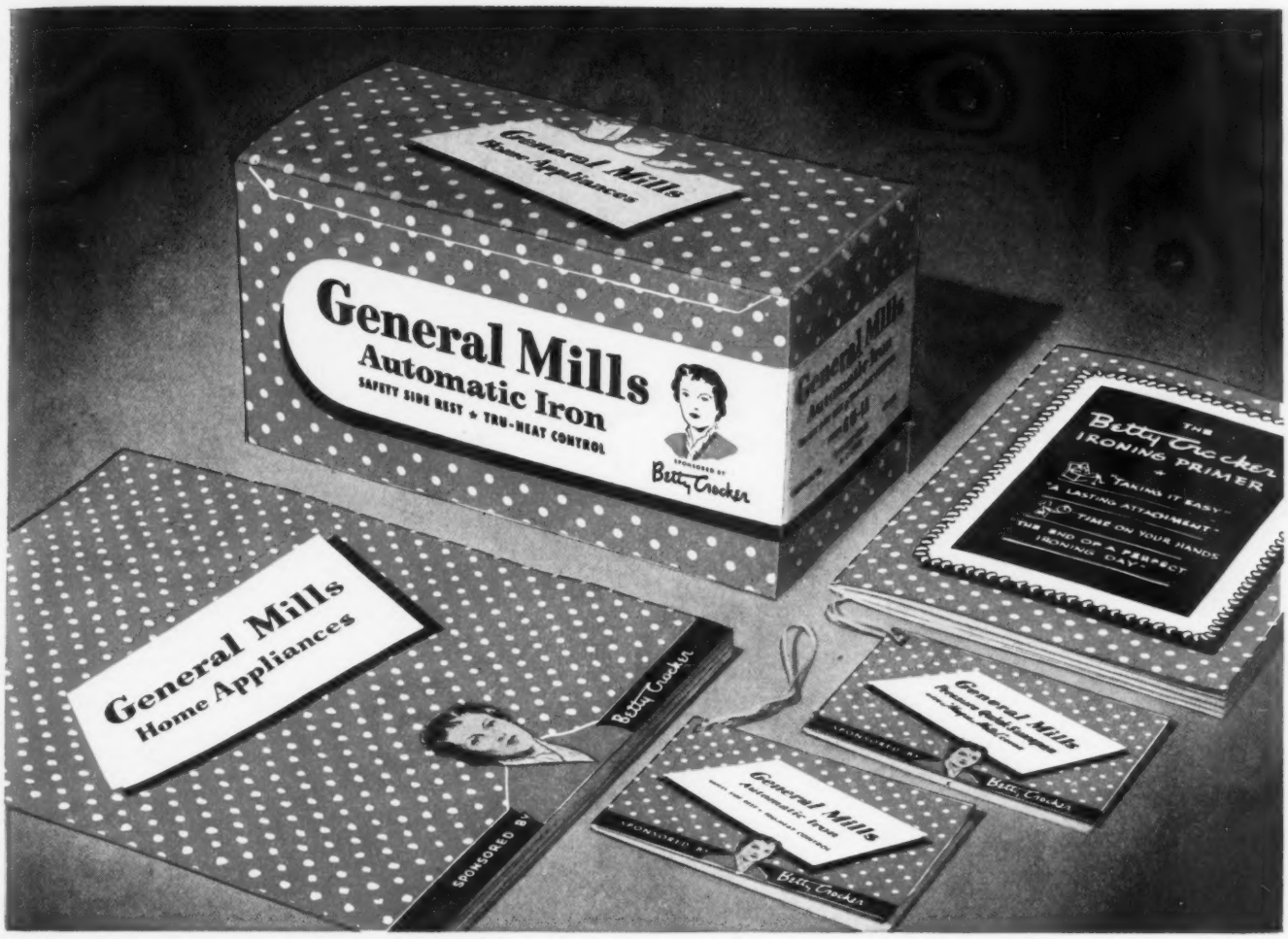
who furnished the material for the article on push-button wiring on p. 66 has been working on this idea for some years and is aiding in the development of small, compact, yet adequate relays to make such a system possible. He was formerly with Anaconda, has been a lecturer on adequate wiring, now runs a technical manufacturers agency in Pasadena.

O. R. Doerr

told the spring meeting of the Pacific Division, NEWA, what the appliance situation in the West is so graphically that his illustrated talk is reproduced on p. 72. Doerr is general sales manager of Pacific Gas and Electric Co. and has been identified with appliance marketing throughout his career, first with Great Western Power, then PG and E.

Preview

Bathtub gin, skirts above the knees, murder and ouija boards were among our legacies from World War One. This time it looks more serious: People seem to find it more and more impossible to get along with one another. In the belief that better dealings between people have their beginnings by some people's getting along better with those they happen to work and live with, ELECTRICAL WEST has asked several thoughtful men to discuss this question in its relation to electrical people. Their contributions will augment the annual June Convention-In-Print.



A brand new pattern for profits...

You've seen polka dots.

But you've never seen polka dots used like this. Millions of them—all captured for the first time on a bright red backdrop to do a selling job for you.

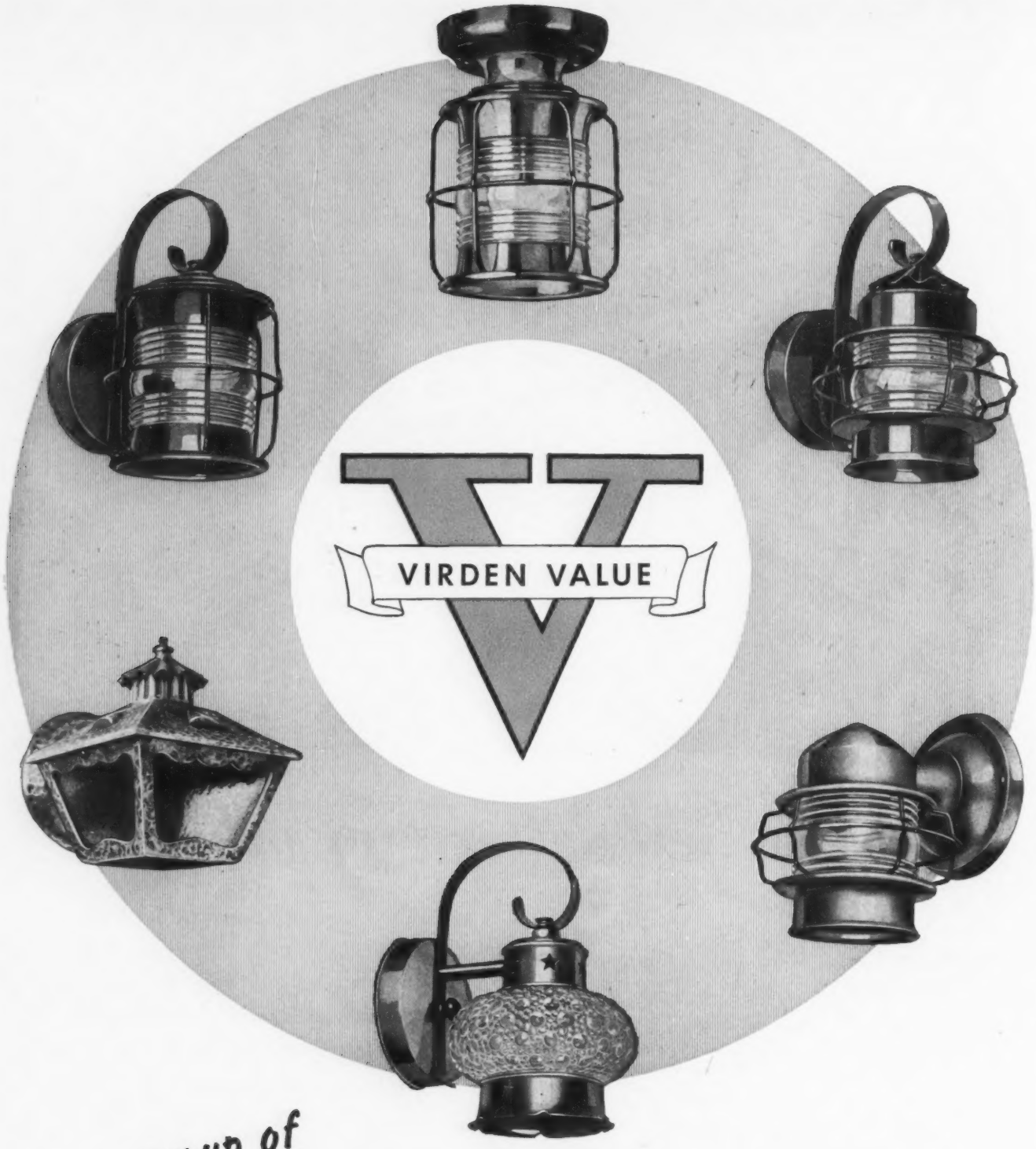
Yes, when General Mills Home Appliances go to market, they'll be dressed in this sparkling feminine pattern. And so will all the sales tools that go with them—ads, displays, catalogs, folders, posters, instruction books.

This one family design—distinctive, brilliant, rememberable—means swift unmistakable identification.

Add to this the reputation of Betty Crocker—America's best known, most helpful home service authority—and you've got a profit push behind General Mills Home Appliances no other line ever had before . . . a *pattern for profits* with powerful selling advantages.

BETTY CROCKER IS A REGISTERED TRADE MARK OF GENERAL MILLS, INC.

GENERAL MILLS, INC., HOME APPLIANCE DEPARTMENT · MINNEAPOLIS 13, MINNESOTA



A group of Smart Outdoor Lanterns

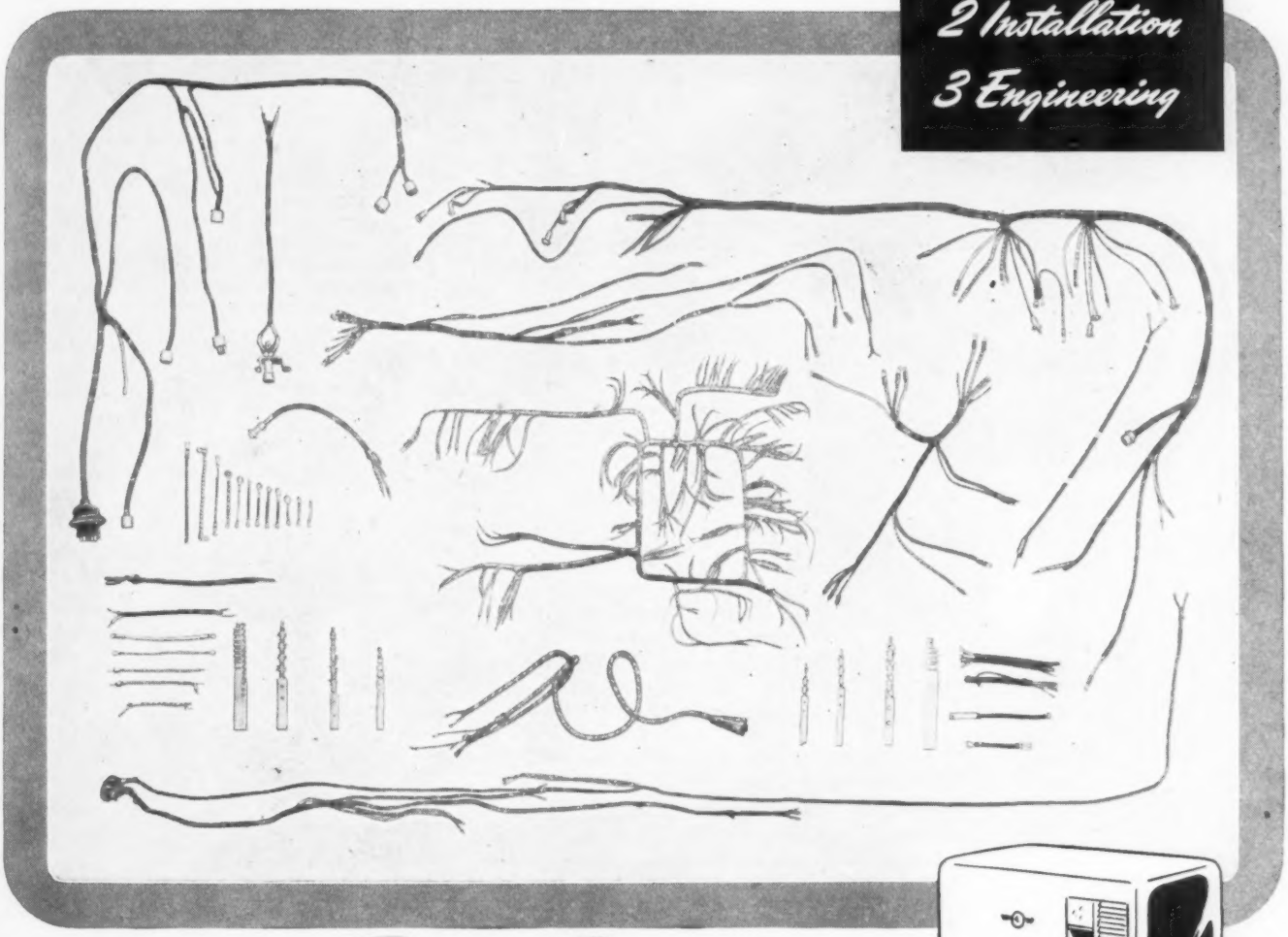
• Designed and styled for today's markets—apartments and houses—the Virden line of Outdoor Lanterns hits current needs right on the button. Demand is strong, shipments satisfactory. To make sure of requirements, see your Virden wholesaler promptly.

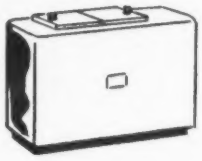
John C. Virden Company • Cleveland, Ohio

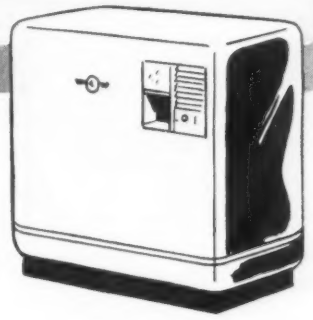
Member American Home Lighting Institute

You Save *3 Ways* with Essex "Packaged" Wiring Harness

1 First Cost
2 Installation
3 Engineering







HARNESS assemblies shown here are typical of what Essex can produce for you, *custom-built* to your exact requirements—*at a saving.* Essex *One-Source* service delivers to you *complete* with all manual and electrical control devices, ready for quick, efficient installation. You are relieved of all details.

Through intense specialization in wiring harness assemblies, Essex has developed line production methods of manufacturing, assembly and inspection, making economical production of high grade, individually tested, specially engineered assemblies possible.

Whatever your wiring problem, it will pay you to investigate Essex *One-Source* service for *complete* assemblies today.

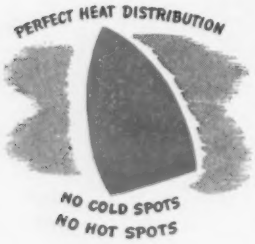
ESSEX WIRE CORPORATION FORT WAYNE 6, INDIANA

Plants: Fort Wayne, Ind.; Detroit, Mich.; Anaheim, Calif.
Warehouses* and Sales Offices: *Atlanta, Ga.; *Boston, Mass.; *Chicago, Ill.; Cleveland, Ohio; Dayton, Ohio; *Detroit, Mich.; Kansas City, Mo.; Milwaukee, Wis.; *Minneapolis, Minn.; *Newark, N. J.; Philadelphia, Pa.; San Francisco, Calif.; *St. Louis, Mo.; *Los Angeles, Calif.

WIRE SX PRODUCTS

SHE LOVES ME...

...She's glad I made her wait for a Never-Lift!



"Yes my Darling Dealer," the lady says to me, "I love you dearly for advising me to wait for a Proctor Never-Lift. What a relief it is not to have to tilt and twist a heavy iron any more...to just press a button and have my Never-Lift lift itself.

"And thanks for the tip about Proctor *Even Heat.* Believe me it's a blessing to have an iron that doesn't drag and wrinkle... or cause unnecessary scorching. And with my Never-Lift I can iron just as fast or slow as I like, thanks to the Proctor Speed Selector."

"You don't surprise me, Madam," I said to her "I've *always* known that the Proctor Never-Lift is the outstanding iron on the market for superior craftsmanship and labor-saving features... has been for years."

"*Not surprised, uh?* she says. "Well, maybe *this* will surprise you—

"Take that and that and that !"

It could happen to you, Brother! Take *our* tip—grab every opportunity to demonstrate the Proctor Never-Lift. You'll get your chance when you get your first Never-Lift next month!

Be smart! Always keep one Never-Lift in your store. Display it... demonstrate it... use it to build store traffic, *pre-sell your customers.*

Meanwhile, come and see us at the Atlantic City Housewares show. It's May 12 through May 17. The Proctor booths are 296 and 298. 'Be seeing you!

PROCTOR NEWSMAKER IN APPLIANCE MERCHANDISING

PROCTOR ELECTRIC COMPANY, PHILADELPHIA 40, PA.

PRODUCTS

that are news

Automatic Washer (500)

The new Apex automatic washing machine employs a "bouncing basket" principle for a four-cycle process of washing, rinsing, drying and fluffing. The clothes are inserted through a top opening into a perforated aluminum and magnesium basket, equipped with a series of smooth, rounded baffles. In the washing step of the cycle, the basket bounces vigorously but does not revolve, the clothes themselves revolving slowly as they are tumbled by the baffles and bathed by geysers of sudsy water spurting from the bottom of the basket. Rinsing is accomplished through alternate use of the bouncing action and a spinning action. For damp drying, the basket revolves for five minutes at 600 r.p.m., reverting to its bouncing action to fluff the clothes. The entire cycle is completed in 17 to 25 min.

A thermostat permits the operator to vary the temperature of the washing water from 130° for fast-colored cottons to 100° for woolens. The rinse water is automatically maintained at 100°. According to the manufacturer, a standard 30-gal. tank can provide enough water to keep the machine operating at peak efficiency through repeated loadings. Usual load is eight pounds of clothes.

An automatic cut-off switch stops all action if the lid is lifted during operation. When the lid is replaced, the cycle is resumed. This washer is 25½ in. square and standard kitchen cabinet height. The cabinet is equipped with interior lighting and the cleansing action may be viewed through a transparent loading aperture cover.

Improved Drawer (501)

Electromaster has introduced a new feature in its 1946 model Banquet range. Drawers of this model move on ball bearing rollers, each roller positioned to carry its proportionate share of the load and each containing 12⅛-in. ball bearings. One roller is directly mounted to the upper rear on each side of the drawer compartment; the other two are assembled to a bracket which is fastened to each lower side of the drawer opening flange of the front panel.

Home Freezer (502)

A home freezer announced by Oreley Bros. has 5 cu. ft. capacity and provides 8 2/3 sq. ft. of horizontal and 14 2/3 sq. ft. of overall freezing surface. This unit incorporates a tray which swings into position as the lid is raised, a patented feature, and the "speed-flo" principle of cooling action for freezing and storage.

One in a series of advertisements appearing in Sunset Magazine and the Los Angeles Times, Home Magazine.

BETTER TALK OVER THE THERMADOR FRANCHISE STORY WITH YOUR DISTRIBUTOR

Los Angeles: Sues-Young Co.

Phoenix: J. E. Redmond Supply Co.

Portland: Eoff Electric Co.

Salt Lake City:
Mountain States Distributors, Inc.

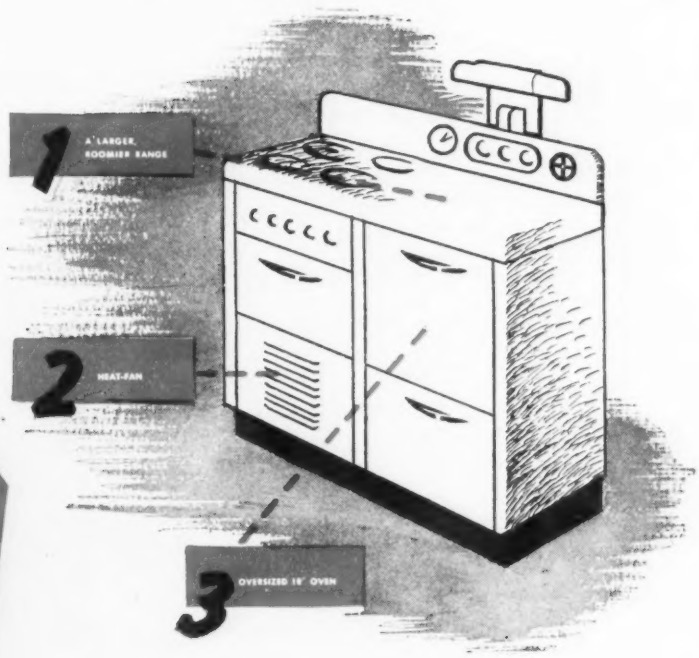
San Diego:
San Diego Standard Electric Corp.

San Francisco: Frank Edwards Co.

Seattle: Herb E. Zobrist Co.

Honolulu, Hawaii: Mutual Telephone Co.

ONLY THE THERMADOR ELECTRIC RANGE GIVES YOU ALL 3



IT'S COMING SOON!...Your new Thermador range, with exclusive, indispensable features that make it the finest range in America. Just consider these remarkable innovations ...all designed to make cooking less work, more fun...

A *built-in, clock-controlled Heat-Fan* that warms your kitchen in winter, cools in summer. ONLY THERMADOR HAS IT.

An *oversized 18-inch oven* so spacious that it will accommodate even the largest roaster. ONLY THERMADOR HAS IT.

A larger, roomier range that provides 30% more working space than the ordinary range. ONLY THERMADOR HAS IT.

AND THAT'S NOT ALL...

Consider, too, these other time-saving, labor-saving features: An easy-to-set *Timer Clock*, a roomy *Deep Well Cooker*, a forget-me-not *Pilot Light*, an *Illuminated Oven*, easy-to-clean *Rod-Type Elements*, a scientifically controlled *Warming Oven*, a *Working Light* and so many others. When you see it, you'll say that the new Thermador was well worth waiting for. *For complete details write Dept. EW-5.*

THERMADOR *Electric*

Seven Leagues Ahead

THERMADOR ELECTRICAL MFG. CO. • 5119 District Blvd., Los Angeles 22

FS and FD Series
CONDULETS

give you an extremely wide choice of interchangeable plain and vaportight covers for **junction boxes, switches, manual motor starters, pilot lights, plug receptacles.**

The illustrations show a representative selection from the 1204 items listed in the FS and FD Section, Condulet Catalog 2500.

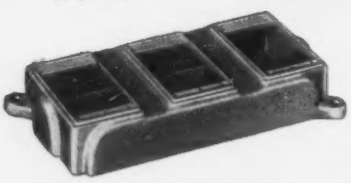
(CONDULETS are made only by CROUSE-HINDS)

No. 8
of a series of advertisements which demonstrate that CROUSE-HINDS "complete line" means much more than just a range of sizes—there is a wide variety of highly specialized types in each classification.

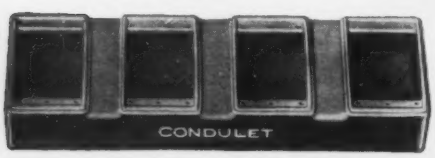
FS Series. Shallow body, takes wiring devices up to 1 5/8" deep. 16 Types.

FD Series. Deep body, take wiring devices up to 2 1/2" deep. 12 Types.

FS and FD Series Two-Gang. Also available in Three and Four-Gang. 32 Types. Take multiple gang covers.



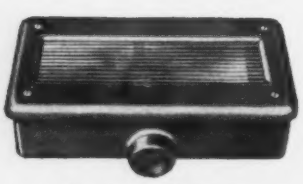
Type FS with bosses for tapping. Available in One to Three-Gang. Take individual covers.



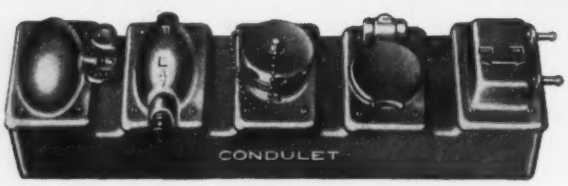
Types FS and FD for any arrangement of welded hubs. Available in One to Five-Gang and Two-Gang Tandem.. Take individual covers.

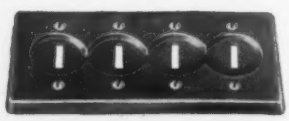
Type FST Threadless with Tumbler Switch. FS and FD Series Condulets are available with threadless hubs for thick or thin wall conduit.

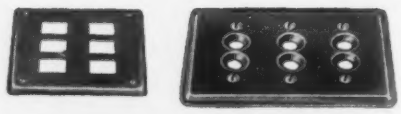
Type EXF Extensions Available for One to Four-Gang

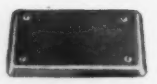


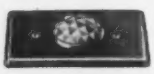
Type FS Lighting Fixture

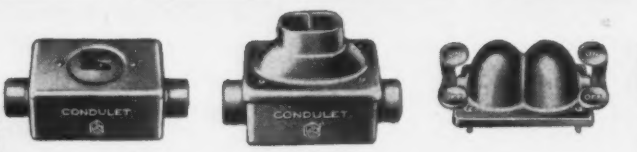


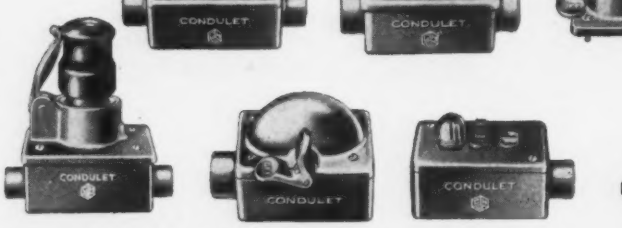


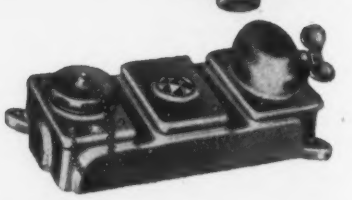


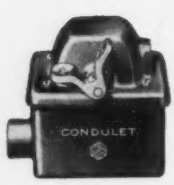


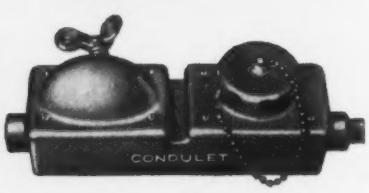












A Nationwide Distribution Through Electrical Wholesalers

CROUSE-HINDS COMPANY
Syracuse 1, N. Y., U.S.A.

Offices: Birmingham — Boston — Buffalo — Chicago — Cincinnati — Cleveland — Dallas — Denver — Detroit — Houston — Kansas City — Los Angeles — Milwaukee — Minneapolis New York — Philadelphia — Pittsburgh — San Francisco — Seattle — St. Louis — Washington. *Resident Product Engineers:* Albany — Atlanta — Charlotte
CROUSE-HINDS COMPANY OF CANADA, LTD., *Main Office and Plant:* TORONTO, ONT.

CONDULETS · TRAFFIC SIGNALS · AIRPORT LIGHTING · FLOODLIGHTS

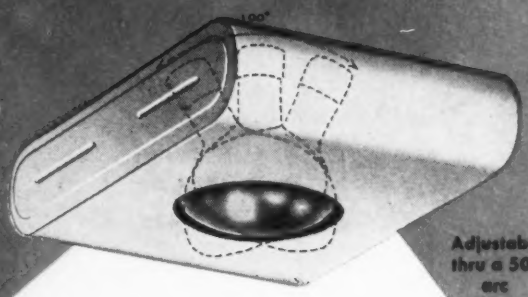
THE *Leader* OFFICER

with

"DIRECLITE"

The most Outstanding Commercial Fixture

*Plus....*MERCHANDISE *"Spot"* LIGHTING



Adjustable thru a 50° arc

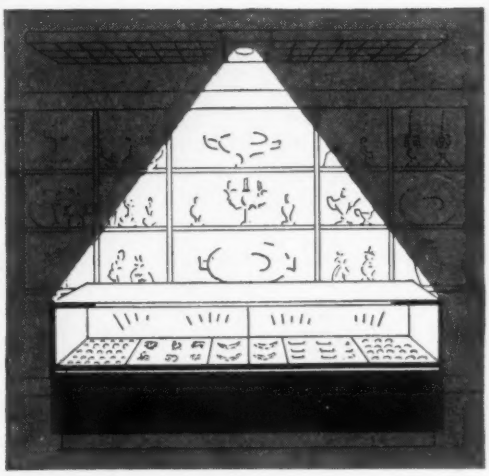
Leader Engineers now present the Direclite for spot lighting of merchandise. Direclite is easily attached at the end of a single unit or the center of a continuous run installation where any Leader Officer is used.

Thousands of installations have already proved the superiority of the Leader Officer Unit. Here is a fixture combining utility and high light output with beauty of design.

Now the Officer Unit is available for additional merchandising uses, thus giving it extra merit to the high position it already enjoys.

Representatives in all principal cities.

Distributed only through the Better Electrical Wholesalers



THERE IS A LEADER REPRESENTATIVE IN YOUR AREA

Leader ELECTRIC MANUFACTURING CORP.

6127 NORTH BROADWAY • CHICAGO 40, ILLINOIS

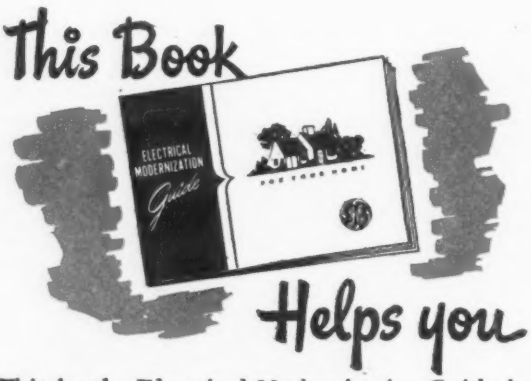
WEST COAST FACTORY • 2040 LIVINGSTON STREET, OAKLAND 6, CALIF.

GIVE A LIFT TO home modernization WITH G-E WIRING DEVICES

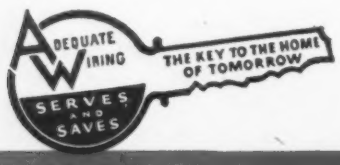
Many homes *must* be modernized electrically to make full use of new appliances and devices necessary for good living. But it's up to you to *show the difference* between a minimum-cost circuit addition and a thorough job—one that leaves the whole house "wired for tomorrow."

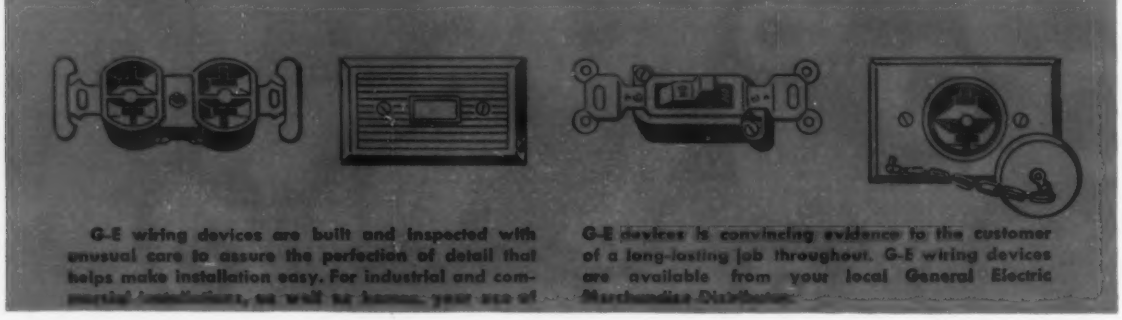
General Electric's full line of wiring devices can help give a lift to the job. For when you suggest *G-E wiring devices* throughout, homeowners will be assured that they are getting soundly built products, free from the quality-cutting they fear so much today.

What's more, you can use specific G-E devices to accent the modern way: Silent switches in bedrooms—waterproof outlets on porches and patios used for dining—clock outlets conveniently located.



This book, *Electrical Modernization Guide,* is offered householders to interest them in modernization of their present homes. You'll find a copy useful when discussing modernization jobs. For your copy, write Section D562-18, Appliance and Merchandising Dept., General Electric Company, Bridgeport, Conn.





G-E wiring devices are built and inspected with unusual care to assure the perfection of detail that helps make installation easy. For industrial and commercial installations, as well as homes, your use of G-E devices is convincing evidence to the customer of a long-lasting job throughout. G-E wiring devices are available from your local General Electric Merchandise Distributor.

GENERAL ELECTRIC

ELECTRICAL WEST Sales Guide

NEWS LETTER FOR THE ELECTRICAL MERCHANT OF THE WEST

May
1946
©

Unless John L. and his coal miners go back underground soon even the trickle of appliances now finding its way West may dry up. The war vets who sweated it out in foxholes now have more sweating to do in half-empty stores. Doesn't anybody want to work any more?

Dig in

Philco had to close its radic set plant in Philadelphia from Apr. 22 to May 6 because it ran out of critical parts. Lack of steel, copper and the ceiling prices on components bogged down the making of parts.

Parts famine

Despite the big fight in Congress over OPA, with short-sighted pressure from incited but unthinking working people, rises are to be expected all along the line. They are coming in the materials field, in wiring supplies, and will soon come in appliances, else there may not be any appliances. All the emotions to the contrary, the mathematics are against it.

They add up

Kay Leber, who impressarios the gift, toy and houseware shows, says that the San Francisco show, Aug. 4-8, at Civic Auditorium, will travel afterward to Portland, Civic Auditorium, Aug. 11-14, and Seattle, Aug. 18-22 at Hotel Olympic.

Gift shows

Telechron, Inc. it will be after May 1, as this electric clock maker drops the "Warren".

About time

Appliance and key sales department people of Hotpoint's distributors, either Graybar or General Electric Supply, are going to get a concentrated, two-day sales training indoctrination beginning June 11 in Seattle, and running through July in San Francisco, Los Angeles and then El Paso, according to Howard Scaife, west coast manager. Al Baughman, showman as well as salesman, will direct, and be aided from Chicago headquarters by Lloyd Sweetland, home laundry sales manager, Miss Bell, home economist, and local district men John McDaniel of Seattle, Bert Rowley and John Jackson of Salt Lake City.

Hot and to the point

Gordon Wilkins has taken on distribution in California for the Beall frozen food locker, manufactured in Portland. Also announces that General Electric Supply will job Rainier water softeners in northern California.

New line

Test farmers

Westinghouse's district home economists have just completed a spot survey of 63 farm families across the country to determine their attitude toward home freezers. A third of those interviewed use them now, another third use locker plant storage. Of the first 40, 34 plan to buy new freezers as soon as available.

Uniforms

Bendix is advocating that all its distributor home service directors and other demonstrators wear a simple, smart uniform developed by its director, Edwina Nolan.

Refresh

Pat Tilley, who heads the General Electric Co. appliance distributing branches, (there's one in Los Angeles) paid the Los Angeles manager, S. B. Maher, a visit recently going over plans. George Lloyd, branch sales manager, is holding refresher classes for the dealers of this unit, three times a week.

Iron out

Electric irons are rolling out of the Ontario, Calif. plant of General Electric Co. again. Don't dast call them "Hotpoint" though, says G-E. It may have been where "Hotpoint" was born and that name came from the point of an iron, but no irons have borne that name now for 10 years. The Ontario plant is now G-E's only iron plant, has made more than 20 million irons, and is expanding by 30,000 sq.ft. to a total of 180,000 sq.ft. and will employ more people.

No more wringers

From still strikebound Westinghouse come two important decisions. It will permanently drop making wringer type washers. Instead, to serve a lower bracket, it hopes to develop a lower priced Laundromat. The other is that Westinghouse has licensed under the Major Armstrong patents for FM radio. Included is a deal to broadcast FM from its Portland, Ore. station.

Stepping out

Thermador is holding showings this month at its western distributors showrooms in Seattle, Portland, San Francisco and Salt Lake City. Bill Cranston, president and Frank Baughman, sales manager of this Los Angeles maker of ranges, water heaters and air heaters, are making the tour. Say they plan deliveries within six weeks on ranges. Have been delivering air heaters.

Ships

Deepfreeze, according to Lloyd Sutton of Frank Edwards Co., has made a shipment to the West Coast and will soon be rolling out more.

Wash again

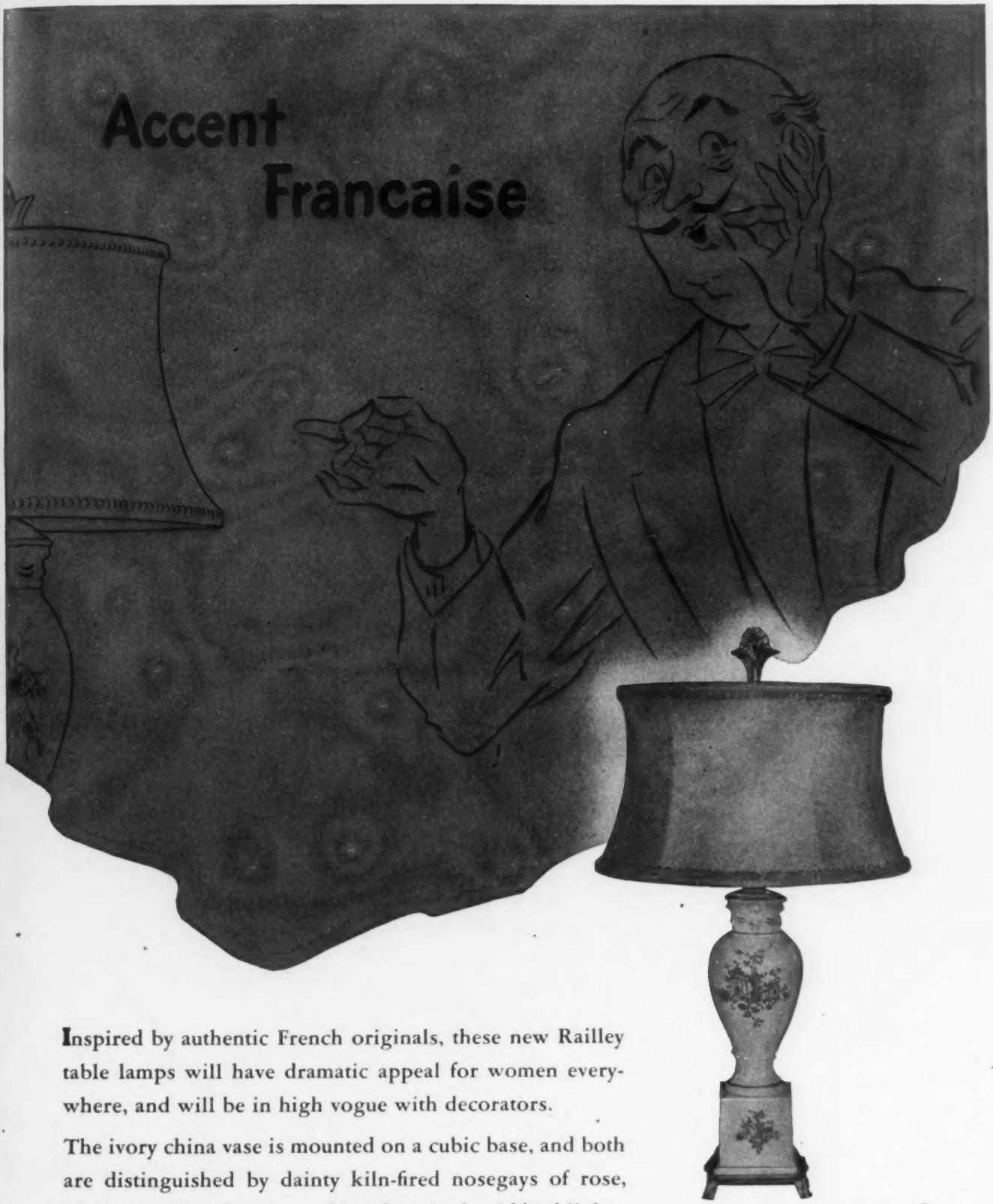
Looks as though Frigidaire will soon be making washing machines again. It has announced the appointment of F. M. Mitchell as manager of its laundry equipment sales and H. C. Morgan, for 13 years with Automatic, as specialist and assistant.

Samples soon

Demonstration models of Simmons electronic blanket will soon be sent to dealers as the blankets are now in production. It is getting newsreel publicity warding off the chill from a hundred pounds of crushed ice covering a "hot" model cuddled under it.

Designs

Federal Television and Radio Co. has Norman Bel Geddes designing a radio, refrigerator and washing machine for it, says Tide.



Inspired by authentic French originals, these new Railley table lamps will have dramatic appeal for women everywhere, and will be in high vogue with decorators.

The ivory china vase is mounted on a cubic base, and both are distinguished by dainty kiln-fired nosegays of rose, blue and yellow flowers, and hand-applied gold highlights. The Lafayette is just one of several beautiful new Railley Table Lamps which will find high favor with your customers.

Railley
CORPORATION · CLEVELAND, OHIO
ORIGINATORS OF THE
PIN-IT-UP LAMP

NEW ADDRESS: 12910 Taft Avenue, Cleveland 8, Ohio

Chromalox Triangulars

Dealers Everywhere! Stock Chromalox Electric Range Units for replacements on any make or size Electric Range.

Housewives the country over prefer CHROMALOX *Electric* Range Units. That's because CHROMALOX *Triangulars* are *Fast, Easy-to-Clean* and *Economical!*

You'll prefer them, too. CHROMALOX Units are profitable to sell and easy to service. They install without muss, fuss or bother; a screwdriver is your only tool . . . and CHROMALOX Adaptor Rings assure perfect fit in all ranges.

Get the facts on CHROMALOX *Triangulars,* the No. 1 unit in the replacement field. Write today.

Better Design . . . Made with Inconel

Cutaway shows patented *flatter,* wider top. Inconel sheath is tough, rustproof, acidproof.

on new ranges and for replacements

CHROMALOX

"ELECTRIC Cooking at Its Best!"

RC-14

EDWIN L. WIEGAND COMPANY, 7540 Thomas Blvd., Pittsburgh 8, Pa.

MONTGOMERY BROS., 1122 Howard Street, San Francisco 3, Calif.; 911 Western Ave., Seattle 4, Wash.; 2333 N. W. Westover St., Portland 10, Oregon; 741 E. Eighth St., Los An-

Homer Freezer (503)

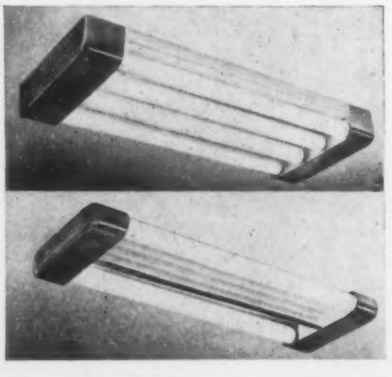
The Maytag home freezer has a 6-cu. ft. locker which will hold 300 lb. of meat or 180 lb. of fruit and vegetables or an average of 240 lb. of mixed packages. The cabinet is 47½ in. long, 29 in. wide and 32 in. high and has an acid resisting porcelain enamel table top with an adjustable drop leaf which may be used as a breakfast or dinette unit. A defrosting pan located on top of the unit utilizes heat from the compressor and keeps the defrosting operation out of the kitchen sink. The lid is counter-balanced and stays in position when up. A 1/6-hp. motor operates the hermetically sealed compressor. This freezer weighs approximately 355 lb. It is said to have an operating temperature of zero Fahrenheit in all climates.

Wall Heater (504)

Hydro-Aire has announced that its wall heater will be ready for delivery in quantity in May. This unit fits flush with the wall and has nichrome wire twin heating elements, highly polished reflector and aluminum or chrome plate grill. Dimensions, 12 x 18 x 4 in.; wattage, 1,500, voltage, 120 a-c; weight, 7 lb. 4 oz.

Home Lighting Units (505)

Designed according to preferences expressed by home owners in a recent survey, the Sylvania Sheffield R-420 (top) and Gorham R-220 (bottom) are for use primarily in kitchens or bathrooms. The Sheffield has four 20-watt fluorescent lamps, the Gorham two 20-watt lamps. Both fixtures come complete with starters.



Door Chime (506)

A door chime enclosed in a bracket shelf is a new item offered by Edwards and Co. Called the Empress Eugenie, this model is finished in antique white.

How to get your share of Store Lighting Business

New G-E Training Program Ready NOW . . .

Here is a complete, inclusive sales training program to help you realize a full share of today's huge demand for modern store lighting. The entirely-new program—developed by G-E in co-operation with the famous LaSalle Extension University—includes five texts that cover basic training in salesmanship, lighting fundamentals, and specialized applications in store lighting. In addition, the whole program provides examinations, personal consultation service and a diploma—for only $12.50 per man.

Training in store lighting salesmanship is only one of General Electric's brand-new, easy-to-use, and all-inclusive sales training programs. All are ready NOW.

For full information on the G-E LaSalle Sales Training Programs—Basic, Store, Office, Industry, Home—see your G-E Lamp representative. See him without delay—TODAY!

"MY MONARCH ROASTER RANGE has 2 ovens"

1

"This built-in electric roaster is actually an auxiliary oven at cooking top height. It saves stooping, saves electricity. It's certainly a convenient place to have a roaster."

Perfect for roasting — complete meals — casserole dishes—quick baking. Convenient basting height.

Smooth flat top for working space when roaster is not in use. (No roaster storage problem.)

2

"When I need additional oven space, I can always use the regular oven which gives me large oven capacity — more than ample for all entertaining requirements. The oven has a separate broiling unit."

RANGES AND HEATERS

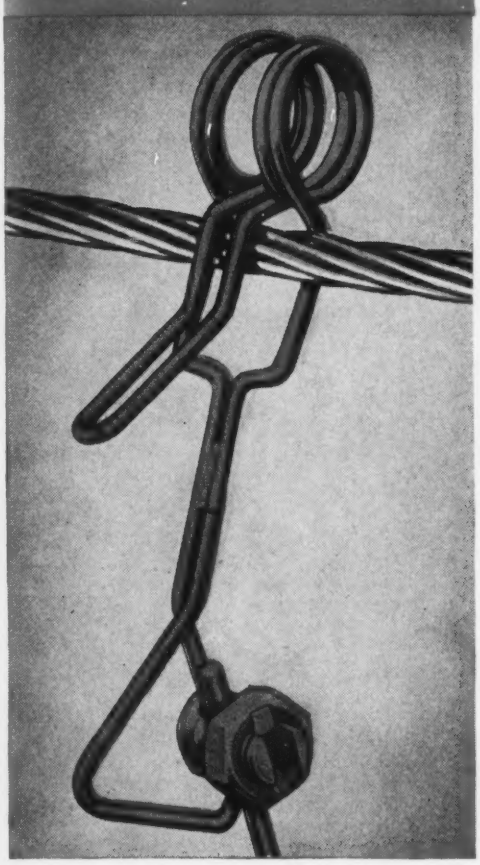
Monarch-Paramount

COAL-WOOD, ELECTRIC, GAS and COMBINATION RANGES

Patented by Monarch . . . built exclusively by Monarch . . . this Monarch Electric Roaster Range — with its twin-oven feature plus many other Monarch convenience — gives you a top quality Electric Range that will direct the spotlight of consumer interest to your sales floor.

MALLEABLE IRON RANGE CO.
3956 Lake Street Beaver Dam, Wisconsin

Better Construction Today . . . Less Maintenance Tomorrow



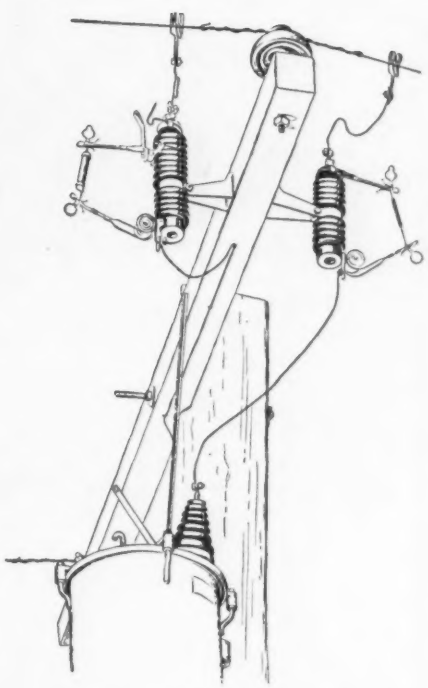
Specify

Tap Lines Quickly with this Low Cost Clamp

Save Time and Money with KEARNEY CON-NEC-TAP CLAMPS

Here's a spring clamp that provides a durable, high pressure contact — and it can be installed or removed quickly with an ordinary switch stick. For tapping small transformers or lightning arresters it has no equal.

Made of copperweld wire especially formed and wound to exert a resilient high pressure. Available in three styles — copper to copper, aluminum to copper and all purpose cadmium plated.



a Trip-O-Link and a Kearney lightning arrester on a rural installation.

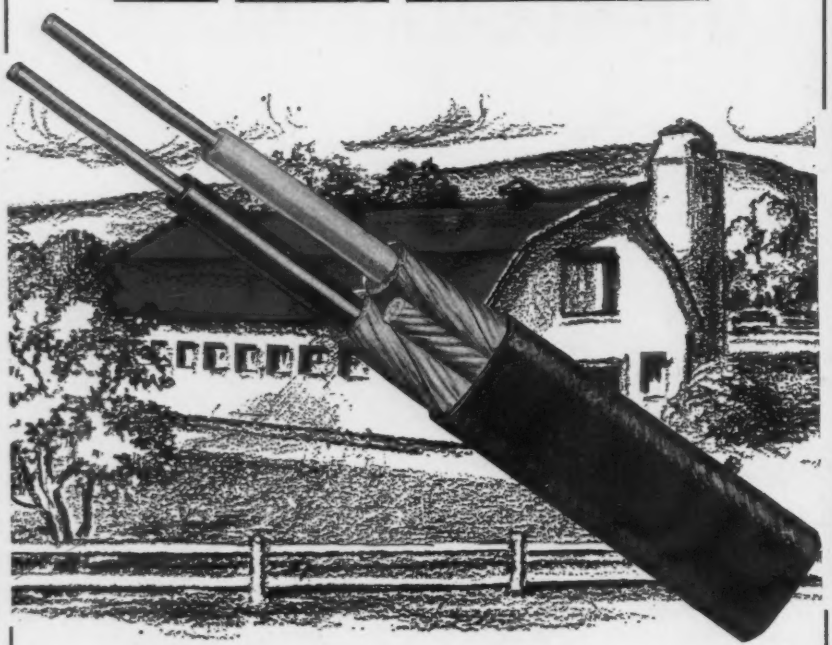
KEARNEY PRODUCTS

MAYDWELL & HARTZELL
INCORPORATED
LOS ANGELES • SAN FRANCISCO • PORTLAND

CRESFLEX

NON-METALLIC SHEATHED CABLE WITH TYPE T CONDUCTORS

Has Many Advantages



A SAFE, PERMANENT low cost cable for interior wiring. The use of SYNTHOL Type T conductors results in a smaller, lighter weight cable, which makes it easier to install and takes less space. The SYNTHOL thermoplastic insulation on the conductors has long life, high dielectric and mechanical strength, and is extremely resistant to moisture, acids, alkali and mildew. Will not burn and is free and clean stripping.

Recommended for farm and rural buildings, as well as for all types of residential construction.

CRESCENT

WIRE and CABLE

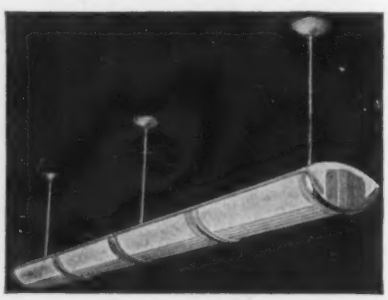
NEMA

CRESCENT INSULATED WIRE & CABLE CO.

TRENTON, N. J.

Indirect Lighting Unit (507)

The Star, a new indirect lighting unit designed by Wakefield, uses a molded translucent Plaskon reflector of such density that the lighted luminaire is of approximately the same brightness as the illuminated ceiling. When units are mounted continuously and according to specifications, they are said to give an evenly lighted ceiling with no deep shadows or sharp contrasts and without glare. The unit is for 40-watt fluorescent lamps, which are accessible from the top of the reflector.



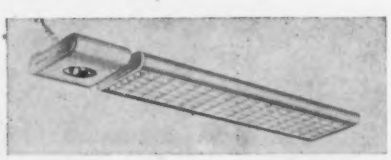
Spot and Flood Light (508)

The Guth Hy-liter is a new unit for spot or flood lighting in merchandise displays and show windows. Adjustment may be made within a 90° arc downward in all directions and light is directed by turning and tilting the louvers. A 150-watt spot or flood type projector lamp is used in the fixture. Styles are available for surface or recess mounting, They may be used individually or may be mounted in continuous rows with fluorescents.

Forty-Sixty Luminaire (509)

Curtis has introduced its Forty-Sixty luminaire, so called because approximately 40% of the light is directed upward and 60% downward. The unit uses two 40-watt fluorescent lamps. It is 12½ in. wide, 5½ in. deep, 48⅛ in. long. Stem hanger suspension is 12 in. from ceiling to top of body. It has Alzak aluminum reflectors and louver fins; wiring channel and end plates are white Fluracite.

Spotlight F Fixture (510)

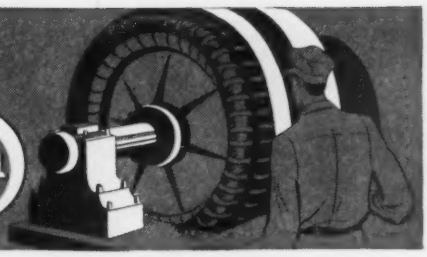


For use in conjunction with its Officer line of fluorescent fixtures, Leader Electric Mfg. Corp. has developed a spotlight F fixture, the Direclite. This attachment spotlights a given area of counter or floor space. It is available for 2- and 4-light fixtures and is adjustable through a 50° arc.

Utility Light (511)

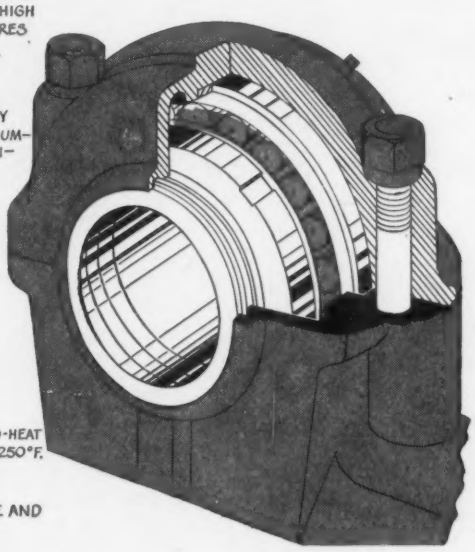
For industrial plants, repair shops, garages, etc., Revere Electric Mfg. Co. is making a utility tool cart equipped with lighting units. A 60-watt lamp in Alzak aluminum reflector mounted on a wide-range adjustable arm may be set on any of the four supporting posts of the cart. A foot brake on one of the cart casters may be set to prevent movement.

STANDARD ENGINEERS NOTEBOOK



CALOL S.A. GREASE ASSURES GOOD LUBRICATION IN HIGH AMBIENT TEMPERATURES

CALOL S.A. GREASE MAY BE USED ON LOW-, MEDIUM- AND HIGH-SPEED ANTI-FRICTION AND PLAIN BEARINGS



WITHSTANDS RADIATED-HEAT TEMPERATURES OVER 250°F.

MINIMIZES DRIPPAGE AND LEAKAGE TROUBLE

New grease lubricates in extra hot conditions

Developed especially for bearings that must operate in radiated heat, new Calol S. A. (sodium aluminum) Grease has proved satisfactory in temperatures over 250° F. It has been tested by many operators on working machines in the field. In addition, it was given a series of tests in the Navy Ball Bearing Machine, operated at 10,000 rpm, with bearing temperatures maintained at a high degree.

Calol S. A. Grease is made from a special type base and selected oils that give it high heat-resistant qualities. In use, these qualities assure minimum drippage or leakage from bearings.

Although Calol S. A. Grease is ideal in a multiplicity of services, it is specifically adapted to the lubrication of low. medium and high speed anti-friction bearings used in all types of machines.

Made in three grades, 00, 0, and 1, by Standard of California, Calol S. A. Grease is available in 35-, 108- and 420-pound containers.

Compounded Motor Oil keeps ring-belt cleaner

More power from the fuel consumed in gasoline engines can be obtained with RPM Compounded Motor Oil.

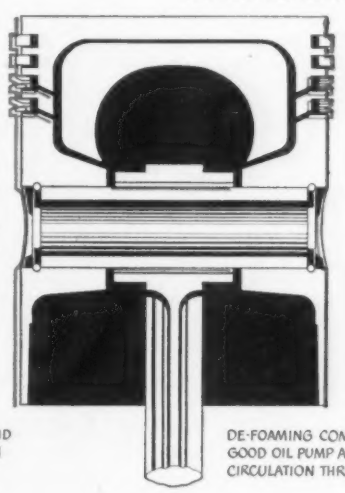
One hundred percent paraffin base, RPM Compounded Motor Oil contains a detergent or cleansing agent that loosens and removes deposits of sticky gum-carbon left on rings, pistons, cylinders and in the oil system by ordinary oils.

It keeps these parts cleaner, gives the oil unusual adherence to metal whether hot or cold, and therefore allows it to form a tight seal at the rings. This lets engines develop more power by preventing blow-by and excessive piston drag in starting and running.

A de-foaming compound in RPM Motor Oil eliminates the danger of air locks in oil pumps or oil pipes caused by bubbles. An adequate supply of oil is constantly delivered to working parts, reducing friction to a minimum. Other compounds in RPM Motor Oil resist oxidation, corrosion and sludge formation.

RPM MOTOR OIL CONTAINS SPECIAL CLEANSING AND ANTI-OXIDATION COMPOUNDS

RPM COMPOUNDED MOTOR OIL STICKS ON HOT OR COLD METAL—REDUCES STARTING AND RUNNING WEAR



DETERGENT KEEPS OIL-RING SLOTS UNCLOGGED—PREVENTS OIL-PUMPING AND BLOW-BY

RESISTS CARBON AND SLUDGE FORMATION

DE-FOAMING COMPOUND ASSURES GOOD OIL PUMP ACTION AND CIRCULATION THROUGH OIL PASSAGES

Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert service—make your maintenance job easier. Call your local Standard Representative or write Standard of California, 225 Bush St., San Francisco 20, California.

FOR EVERY JOB A **STANDARD OF CALIFORNIA** TEST-PROVED PRODUCT

6 REASONS

WHY COOPER FASTENERS

ARE SPECIFIED BY WESTERN INDUSTRY

1 **ECONOMY** — Cooper fasteners up to 1" diameters are made by cold-heading, rolled-thread methods which completely eliminate waste material, cut production costs to a minimum and permit low, competitive prices.

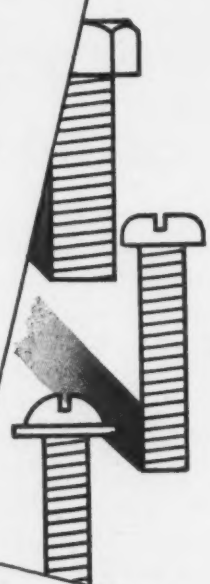
2 **QUALITY** — Because they are cold-forged, Cooper products have maximum tensile strength. Uniformity of all dimensions makes assembly work a simple, uninterrupted operation when dependable Cooper fasteners are used.

3 **WIDE RANGE** — Standard sizes range from 3/32" to 1 ½" diameters; lengths from 3/16" to 60" — **in any metal** (steel, brass, stainless, monel, copper, aluminum, or their alloys).

4 **SPECIALS** — Manufacturers confronted with an unusual fastening problem have found Cooper's engineering and metallurgical staff an invaluable aid in fulfilling their needs for special threaded products.

5 **MODERN PRODUCTION METHODS** — Located in the heart of Western industry, Cooper Screw Manufacturing Company is the largest, most completely integrated plant west of Chicago making screws and bolts by the upset process. These facilities produce and process 35 million pieces a month.

6 **LARGE JOBBER STOCKS** — Jobbers in key Western cities can supply your needs quickly and efficiently. Ask your Jobber for Cooper Fasteners.



If you would like to see bolts, screws, rivets and pins actually being made we invite you to be our guest. No need to make an appointment — simply drop in at the plant, at your convenience.

COOPER *Screw Manufacturing Company*

4466 WORTH STREET • LOS ANGELES 33, CALIFORNIA

Branch Office: 529 Central Bank Bldg., Oakland, California.

Representatives

Seattle, Wash.	*Portland, Ore.*	*San Diego, Calif.*	*Houston, Texas*
L. M. Baxter Co.	L. M. Baxter Co.	California Sales Agcy.	Robert L. Knowles Co.
1006 Lowman Bldg.	1238 N.W. Glisan St.	666 State St.	613 Second Nat'l Bk. Bldg.

AVOID DANGEROUS "SINGLE PHASING" BY USING KYLE AUTOMATIC THREE PHASE OIL CIRCUIT RECLOSERS

Only KYLE gives you Dual Operating Characteristics

Exclusive KYLE dual operating characteristics give:

1 Fast opening on first and second operations. This permits the automatic clearing of temporary faults without damage to sectionalizing fuses.

2 Time delay on third and fourth operations. This allows the affected fuse to blow, isolating the permanent fault, keeping main lines in service.

After the sectionalizing fuse blows, the Kyle Recloser resets itself for another cycle of operations.

• Many a burned-out motor results from even a short period of "sing phasing" when a permanent fault develops on one phase of a three pha system.

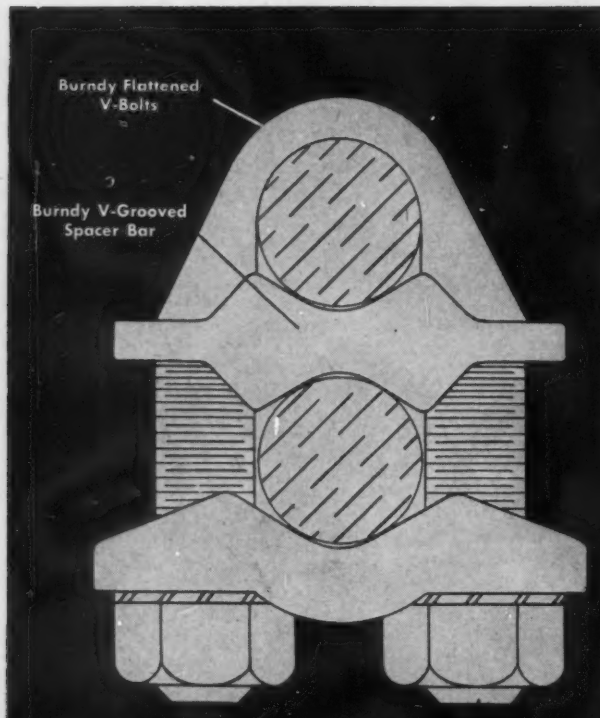
Kyle Type "3H" Automatic Oil Circuit Reclosers eliminate this dang A permanent fault on any one phase will cause the Kyle Recloser to lo out automatically and disconnect service on both the other phas immediately.

Kyle Reclosers perform this vital function with the important addition feature of coordinating with fuse links to keep as great a portion of yo lines as possible in service all the time.

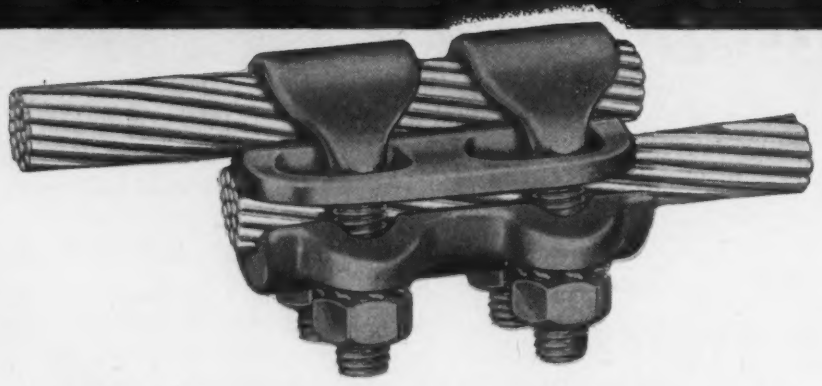
For complete information on the protection for three phase lines afforded by Kyle Type "3H" Reclosers see your Line Material Representative.

MADE BY KYLE CORPORATION SOUTH MILWAUKEE WISCONSIN

LINE MATERIAL COMPANY



Full contact pressure on *Both* conductors!



Burndy Type VP PARALLEL CLAMP

- Full pressure in series on both conductors
- Flattened V-bolts distribute pressure over wide area
- Short, direct current path
- Closed mechanical system
- Double clamps provide added security

Available for cables from 1/0 Str. to 2000 Mcm. Either groove accommodates a wide range of cable sizes. Full details on request.

BURNDY

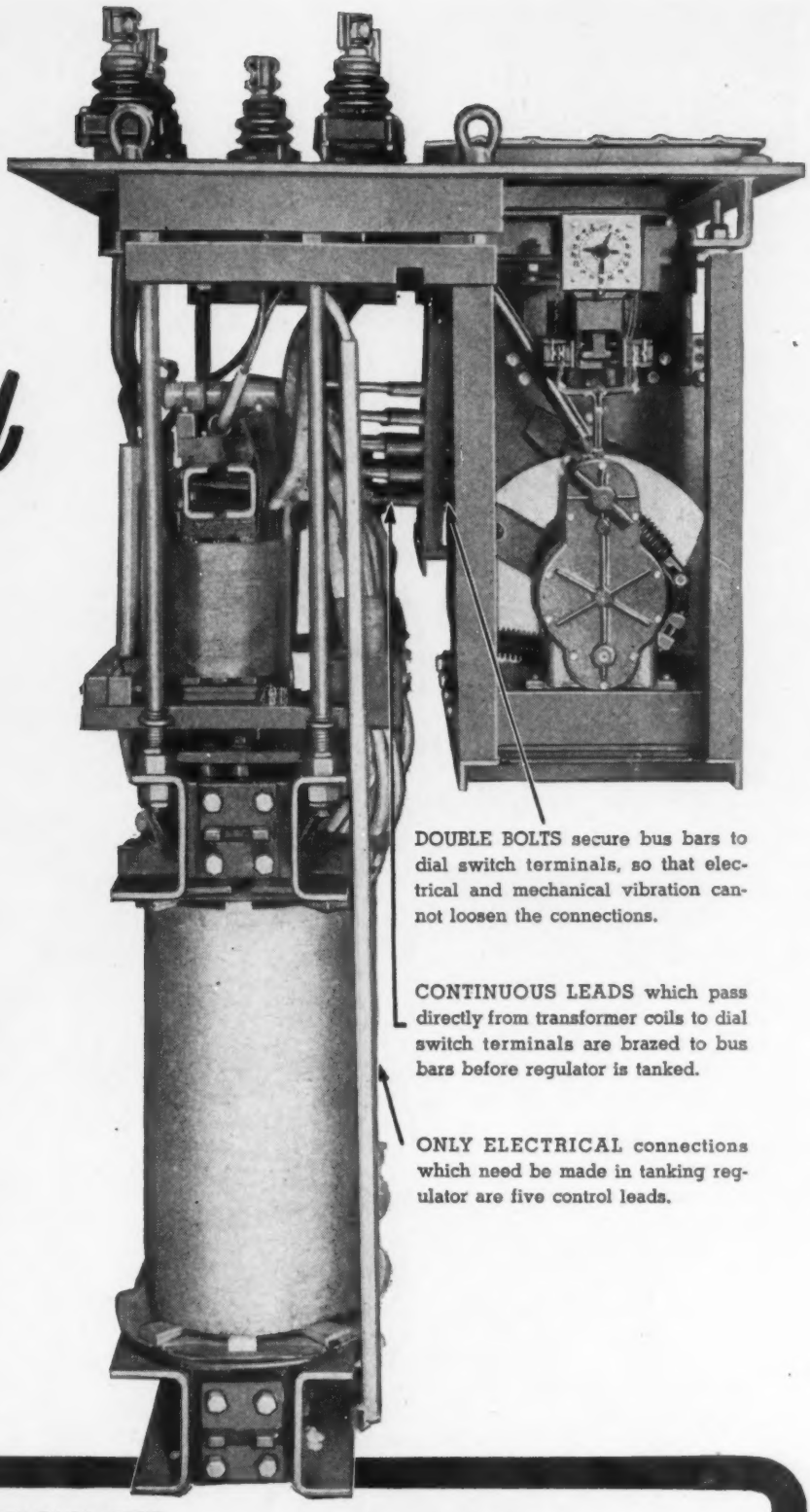
Burndy Engineering Company, Inc.
107-V Bruckner Blvd., New York 54, N. Y.

78 Trouble Spots Eliminated

BY UNIT CONSTRUCTION OF REGULATORS

Both transformer and tap-changing mechanism are *suspended from the cover* in Allis-Chalmers 5/8% Step Regulators with unit type construction. By doing away with 78 bolted connections, 78 possible trouble spots are eliminated! Some of the benefits to you of Allis-Chalmers unit construction: high grade workmanship, exact factory inspection, and easier untanking of regulators.

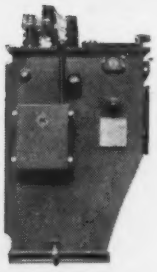
A 2001



DOUBLE BOLTS secure bus bars to dial switch terminals, so that electrical and mechanical vibration cannot loosen the connections.

CONTINUOUS LEADS which pass directly from transformer coils to dial switch terminals are brazed to bus bars before regulator is tanked.

ONLY ELECTRICAL connections which need be made in tanking regulator are five control leads.



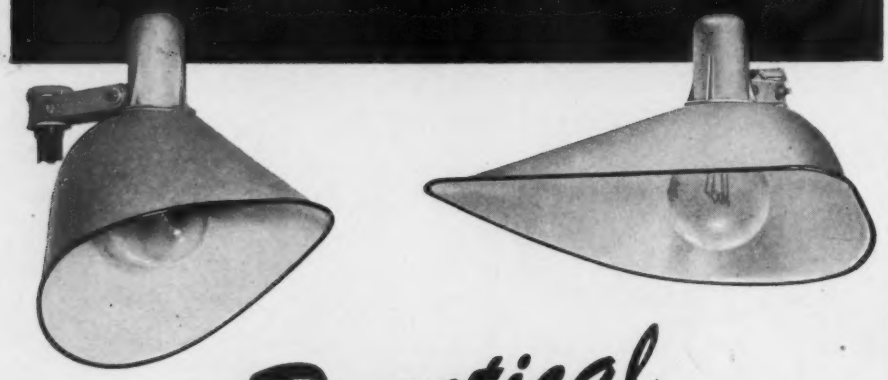
GET THE BEST IN 5/8% STEP VOLTAGE REGULATION

Extremely close voltage output (±1%) results from voltage integration and "Feather-Touch" control, obtained in A-C 5/8% Step Regulators. And famous "Quick-Break" tap-changing mechanism means long contact life! For details, see our nearby office, or write ALLIS-CHALMERS, MILWAUKEE 1, WIS.

ALLIS CHALMERS

5/8% STEP REGULATORS

FOR WORK OR RECREATION



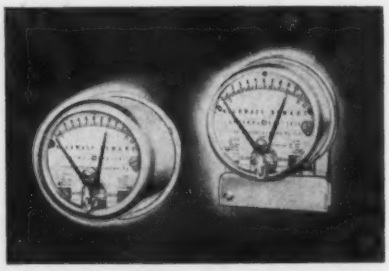
Practical
FLOOD LIGHTING
for parking lots, sports areas, filling stations, or the home yard

SMOOT-HOLMAN COMPANY
SMOOT-HOLMAN
INGLEWOOD, CALIFORNIA
MADE IN U.S.A.

LOOK FOR THIS LABEL FOR THE FINEST IN INCANDESCENT OR FLUORESCENT LIGHTING

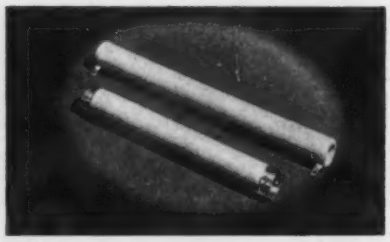
Thermal Demand Meter (512)

A thermal watt-demand meter operating on the direct-heat principle has been designed by General Electric. In this instrument, Type HI-1, temperature-sensitive, bimetallic spirals act as their own heaters to increase life and accuracy while minimizing need for maintenance. The temperature-sensitive elements are attached directly to a shaft and gear. As electric energy flows through the thermal element, the heat produced causes the spiral to deflect, rotating the shaft and gear, which drives a red pusher pointer. Maximum demand is indicated by a black pointer, which is pushed upscale by the red pointer. The direct-heat principle has been applied also to a true single-phase kva. demand meter, and other types are in the development stage, the company states.



Resistors (513)

Additions to the Ward Leonard line are Vitrohm "M" vitreous enameled resistors, designed for power type applications where severe operating conditions exist. These resistors are available in ferrule, tab and screw terminal types with power ratings from 8 to 155 watts, and are capable of operating continuously at 275°C. Sizes range from 0.1 to 80,000 ohms with tolerances for one ohm and above of plus or minus 5%.



Connectors (514)

Ideal Industries has added a line of split bolt and service entrance connectors. The split bolt connectors are available in one piece and two piece with small and large heads and in bronze, brass or aluminum. Size range will accommodate all solid and stranded wire from No. 6 to 1,000,000 cm. The service entrance connectors are of cold drawn copper and are in five sizes from No. 12 solid or No. 10 stranded to No. 2 stranded.

Teflon (515)

Tetrafluoroethylene resin, a plastic material developed by Du Pont and manufactured for special military use during the war, is available in limited amounts for experimental purposes. It is said to withstand acids which dissolve gold and platinum and to retain its strength and form at higher temperatures than any known organic material. It is unharmed at 575°F. and has been used for insulation in radio, television and in jet engines.

has pleased a lot of people in over 30 years

"There's Tested Strength in Every Length"

SPANG-CHALFANT

Division of The National Supply Company

General Sales Office: Grant Bldg., Pittsburgh 30, Pa.

District Offices and Sales Representatives in Principal Cities

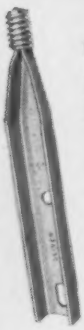
for your rural line construction this spring...

OLIVER POLE LINE MATERIALS

From the complete line of Oliver Pole Line Materials you can select items designed and made specially for rural line construction. Some of these are illustrated below. A half-century of experience gives Oliver the knowledge needed for the manufacture of line materials that will have long life and give satisfactory service. See your Distributor.

POLE TOP PINS

The complete line of Oliver galvanized steel pole top pins includes straight and offset types, all commercial sizes, and various designs. The pressed steel type is shown here.



INSULATOR PINS

The pin illustrated is forged in one piece from mild steel, and is free from laps, seams and welds. Square wrench shoulder facilitates lining-up insulator groove. Other types are available as required for various services.

INSULATED CLEVISES

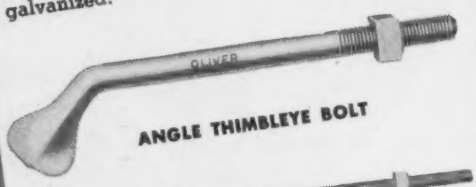
The wide variety of Oliver Clevises offers styles for every type of application and kind of construction. Styles include eye, split, swinging and plain types. Insulators are of either wet or dry type porcelain. Open hearth steel is used, hot dip galvanized.

GUY CLAMPS

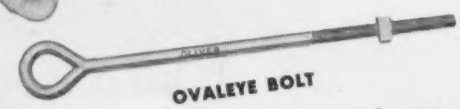
Light, medium and heavy types for one to four bolts. Straight, smooth, parallel grooves offer greater clamping area.

BOLTS

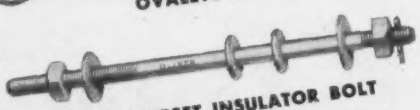
All types of bolts required for line construction are made by Oliver. Some of the more popular types are illustrated below. Features of Oliver bolts are: accurate dimensions, speed points, clean threads, hot dip galvanizing. Oliver nuts likewise are accurately made and tapped, and galvanized.



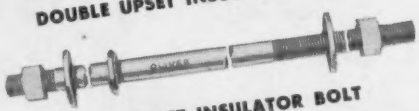
ANGLE THIMBLEYE BOLT



OVALEYE BOLT



DOUBLE UPSET INSULATOR BOLT

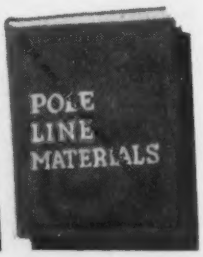


SINGLE UPSET INSULATOR BOLT

OLIVER IRON AND STEEL CORPORATION

SOUTH TENTH AND MURIEL STREETS · PITTSBURGH 3, PA.

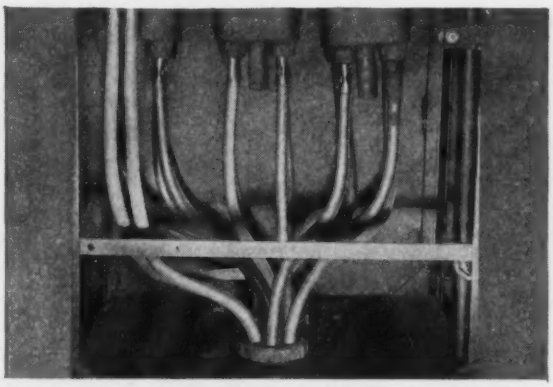
WRITE for complete data on Oliver Pole Line Materials. Ask for Catalog No. 43.



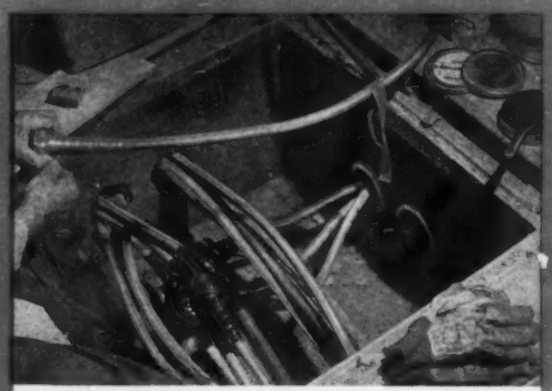
WIRE and CABLE USERS

WROTE OWN "SPECS" for RESEARCH LABORATORY

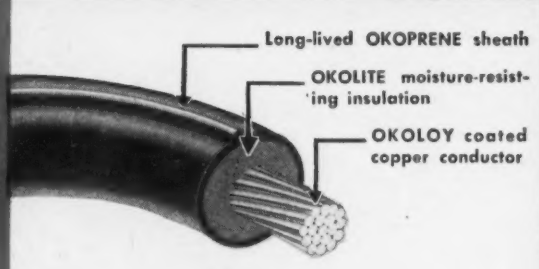
Before equipping their new and completely modern laboratory, the engineers of a world-famous research organization decided to write their own specifications. Drawing on the extensive experience and test results of their own, they called for wires and cables insulated with an oil-base compound protected by a sheath of neoprene. *They knew what they wanted:*—wiring that would resist flame, moisture, heat and chemicals. *They GOT what they wanted:* — Okolite-Okoprene* cables shown in pictures below. The job is described in Bulletin OK2035, the cable in Bulletin OK2009-C both available on request. The Okonite Company, Passaic, N. J.



Connections for one of three 208-volt ring mains in cellar of laboratory at low side of 4150 volt distribution transformer. The 4/0 Okolite-Okoprene cables are colored blue, red and black for phase identification.



Taps being made in 3' x 3' distribution manhole. Exposed section of conductor and connector insulated with Okonite splicing materials. Okolite-Okoprene cables were specified for tough, damp locations.



OKOLITE-OKOPRENE cables offer such additional advantages as:— no braids to rot . . . simple, flexible, long-lived construction . . . tough weather-resistant jacket of uniform thickness requiring no other covering . . . high surface resistance that eliminates surface discharge . . . 75°C operation.

OKONITE RUBBER TAPE AND MANSON FRICTION TAPE offer a combination known the world over for dependable protection and high quality in jointing and splicing operations. Okolite High Voltage Corona-Resisting Tape and Okonite Cement help round out a complete line of tapes and splicing materials. For additional data, write for Bulletin 1007.

*U. S. Pat. No. 2,312,058

OKONITE insulated wires and cables

THUMBS DOWN ON VARNISH FAILURES

Don't depend on guess work in the selection of Insulating Varnishes. Choose the exact type for each requirement from the specialized materials which comprise the Pedigree line. Higher dielectric strength . . . Maximum mechanical, thermal and chemical protection . . . uniform quality . . . all these add up to better performance.

Pedigree Varnishes

Get your copy of the Pedigree Varnish Catalog today. Just write . . . no charge.

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INSULATION MANUFACTURERS CORPORATION

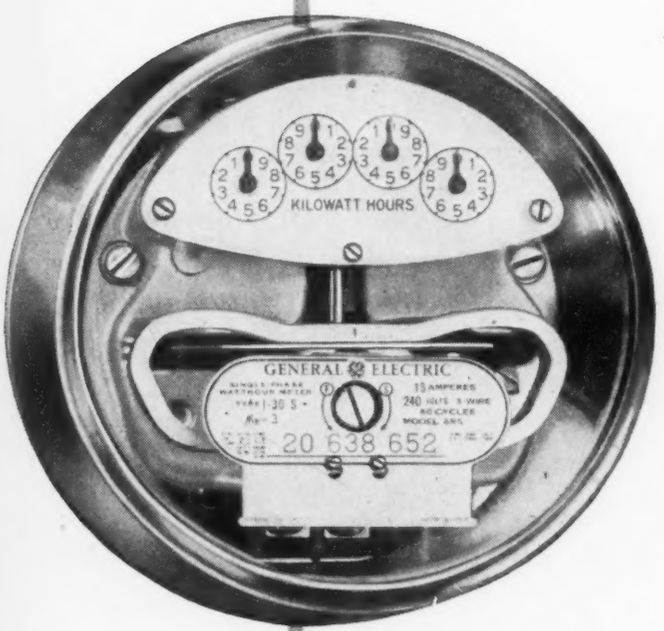
INSULATION AND WIRES INCORPORATED

TRI-STATE SUPPLY CORPORATION

Manufactured by

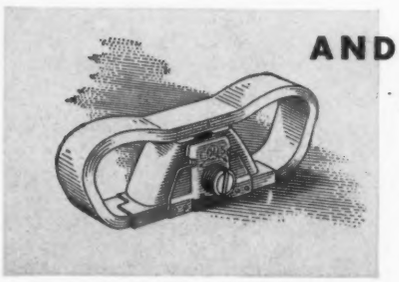
THE R. D. GEORGE COMPANY, ST. LOUIS, U. S. A.

You can count on the



I-30

FOR MAGNETIC STABILITY



AND NO WONDER! At the heart of this meter is a G-E alnico magnet

This surge-resisting magnet owes its stability to (1) all-welded, one-piece construction, (2) careful control of material and dimensions at every step in manufacture, and (3) the inherently high coercive force of alnico. It helps make the I-30 a meter you can depend upon—a meter that maintains its excellent performance under increasing loads in both urban and rural service.

Include the I-30 in your metering program. It's the safe thing to do. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

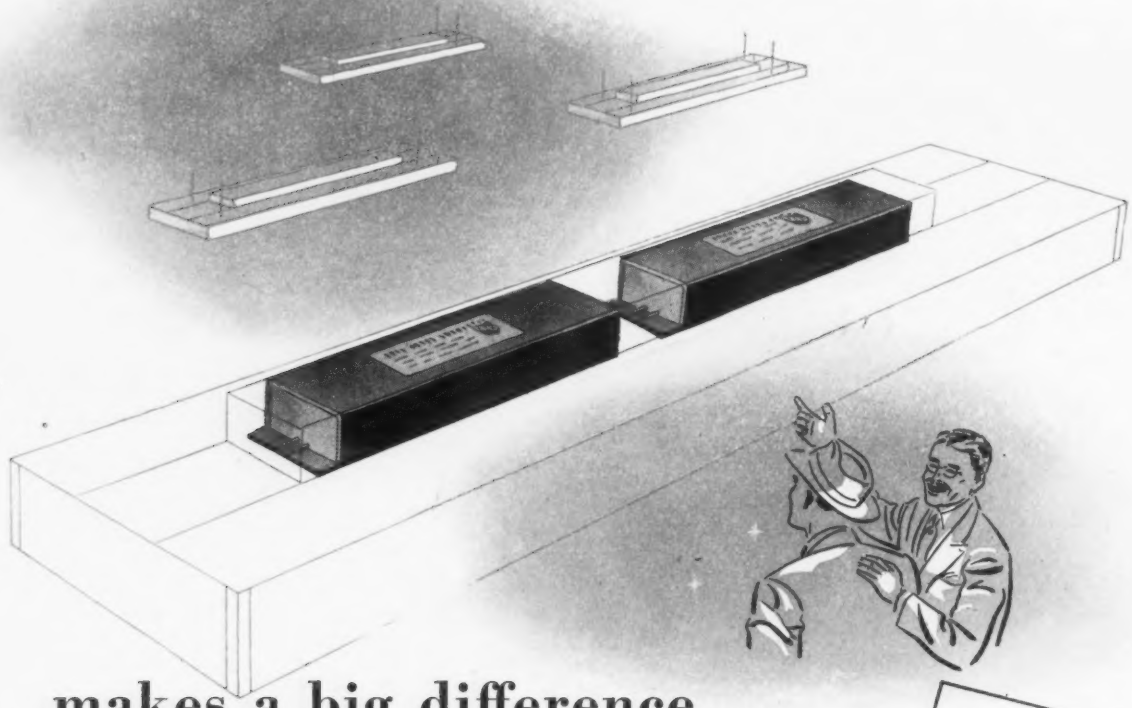
WATTHOUR METERS

Headquarters for Electrical Measurement

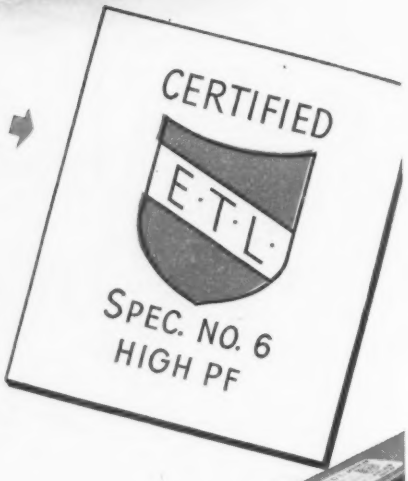
GENERAL ELECTRIC

601-15-6110

The thing you can't see...



makes a big difference in lighting performance!



Most *users* of fluorescent lighting fixtures aren't aware that things like ballasts exist. They're concerned with light-for-attraction and light-for-selling.

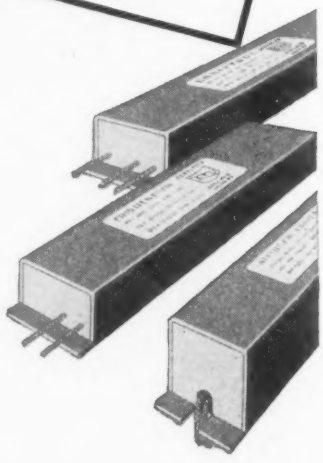
But the man who *sells* fluorescent lighting *is* aware. He's concerned with lighting performance and fixture operation. Most men who know lighting also know that CERTIFIED BALLASTS, the hidden heart of the fixture, assure satisfied customers . . . freedom from service worries.

What's the big difference? Just this:

CERTIFIED BALLASTS are built to exacting specifications set up by foremost lighting engineers. They are thoroughly tested and checked by impartial experts, Electrical Testing Laboratories, Inc., before they are CERTIFIED as meeting the specifications.

And leading fluorescent tube makers will guarantee lamp performance when CERTIFIED BALLASTS are specified in fixtures.

For new fixtures or for replacement in existing equipment, *remember the hidden difference* . . . specify CERTIFIED BALLASTS.



Certified Ballast Manufacturers

Makers of Certified Ballasts for Fluorescent Lighting Fixtures

CHICAGO TRANSFORMER CORP.
3501 Addison St., Chicago, Illinois

GENERAL ELECTRIC CO.
Specialty Transformer Division
1635 Broadway, Fort Wayne, Ind.

JEFFERSON ELECTRIC CO.
Bellwood, Illinois

SOLA ELECTRIC CO.
2525 Clybourn Ave., Chicago 14, Illinois

WHEELER INSULATED WIRE CO.
378 Washington Ave., Bridgeport, Conn.

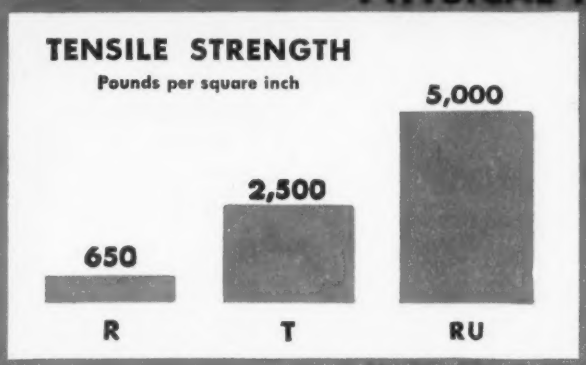
COMPARE Laytex (RU)

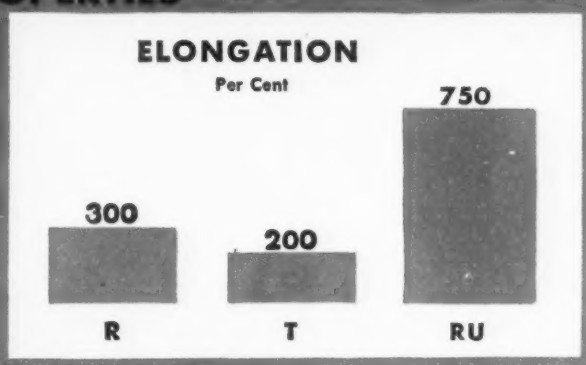
Reg. U. S. Trade Mark

Electrically and Physically

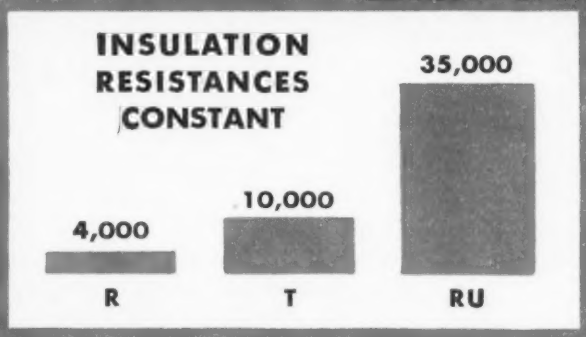
(60° Operation)

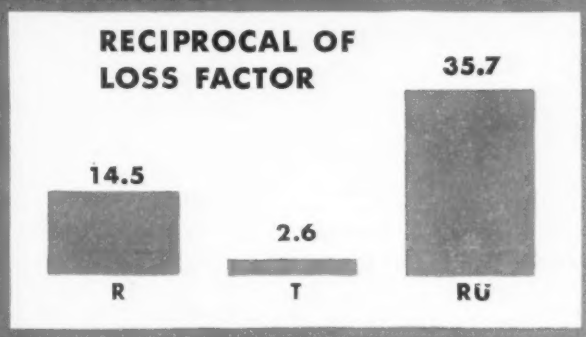
PHYSICAL PROPERTIES





ELECTRICAL PROPERTIES





THREE TYPES of building wire are authorized under the new Electrical Code. These are:

R—Used by the Industry since its inception. The copper conductor has a Code rubber insulation and fibrous overall cover.

T—A copper conductor with VINYLITE, (a synthetic compound) insulation.

RU—LAYTEX. This type has a copper conductor, *natural rubber insulation* and fibrous cover.

The charts above show the wide margin by which LAYTEX leads in physical and electrical qualities. This is America's lightest weight, smallest diameter, natural rubber covered wire. *Now available without restriction.*

SERVING THROUGH SCIENCE

Nothing Insulates like Rubber

UNITED STATES RUBBER COMPANY

1230 AVENUE OF THE AMERICAS • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

* The illustration expresses the application of heat and pressure used to forge crossbars and bearing bars into one integral unit.

There's a big difference between ordinary grating and Blaw-Knox steel grating safety. For Blaw-Knox is the *only* grating with the electroforged *twisted bar.*

In factories, on cat-walks—see to it that skid-breeding floors are made skid-proof in any weather. Specify Blaw-Knox steel gratings, the only gratings with built-in twisted-bar safety factor.

...AND HERE ARE 5 REASONS WHY

1. SELF-CLEANING, no sharp corners to clog.
2. MAXIMUM OPEN AREA for light and air.
3. EASY TO MAINTAIN... paint reaches entire surface.
4. STRONG electroforged construction for easy erection.
5. SAFE footing at all times with twisted cross bar.

When further improvement in open-steel floors is called for by changes in business practice—Blaw-Knox will lead as always.

Blaw-Knox Catalog No. 1887 gives complete details on Blaw-Knox Electro-forged Steel Grating. Send for it.

DIVISION OF BLAW-KNOX COMPANY
2098 Farmers Bank Building, Pittsburgh 22, Pa.

Seven Blaw-Knox plants have been awarded the Army-Navy "E", and have regularly received renewal stars for continued high achievement in the production of war material.

BLAW-KNOX GRATING

Analyzer (516)

Weston has a small-size broad-range analyzer having five completely overlapping a-c and d-c voltage ranges, seven d-c current ranges, four d-c resistance ranges and five decibel ranges. Each d-c voltage range is available at a dual sensitivity of 1,000 or 20,000 ohms per volt. Model 779 is 6⅝ x 9⅛ x 4⅞ in.

Television Capacitors (517)

General Electric has a new line of small, light-weight capacitors for television receivers. These Lectrofilm units are equipped with prong type terminals to meet special mounting requirements of television receiver applications and are currently available in two designs, a flat cylinder and a tubular construction. They are rated 0.005 microfarads, 5,000 to 16,000 volts.

Clock Hanger Outlet (518)

Frank Adam Electric Co. is making a new clock hanger outlet, providing electrical connection and support in a single unit. Because the plug fits flush with the plate, the recessed receptacle permits the clock to hang flat over the outlet, without exposed or trailing cord. This device is regularly supplied with .040-in. brush brass finish plate and 15 amp., 2-wire receptacle.

Enclosed Motor (519)

A new totally enclosed, fan-cooled motor in General Electric's Tri-Clad induction line is available in standard, explosion-proof and dust-proof types from 1 to 1,000 hp. and can be used where iron dust and metal filings are in the air and in Class I, Groups C and D and Class II, Groups E, F and G hazardous locations.

Heater (520)

Emerson Electric Mfg. Co. has a combination radiant and fan type heater with a capacity of 4,275 B.t.u. per hour and a fan which forces 150 cu. ft. of air per minute over the heating surfaces. This product has an adjustable mounting which tilts up or down, within a 40° arc. Weight is 11 lb.

Motor Lead Tags (521)

Columbia Basin Mfg. Co. is again offering for civilian use its motor lead tags for identifying the leads in 3-phase motors. These numbered tags are available in three lengths, ⅝, 1¼ and 2 in. They are packed 100 tags of nine numbers, or 900, to the set.

"I've tried them all... THIS IS THE STARTER FOR *ME*!"

Ask any experienced maintenance man what across-the-line starter he prefers. Chances are he'll say "Allen-Bradley." The reason—Allen-Bradley solenoid starters are practically trouble-free. The patented, silver alloy contacts never need maintenance. The solenoid plunger is the only moving part. It moves through frictionless, stainless steel guides. Potential troublemakers such as bearings, pins, hinges, pivots, and flexible connectors are entirely eliminated on these starters. Specify Allen-Bradley on your next starter job . . . it pays!

ASK YOUR MAINTENANCE MAN— *HE KNOWS!*

NO CONTACT MAINTENANCE

with these Double Break, Silver Alloy Contacts

The contacts of all Allen-Bradley solenoid starters are of patented cadmium silver alloy. Oxides which may form on these contacts are good electrical conductors. Hence, the contacts never need cleaning, filing, or dressing. By avoiding contact maintenance you not only save valuable contact life, but also maintenance time and trouble. In addition, the double break contact construction eliminates flexible jumpers—a frequent source of trouble.

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY

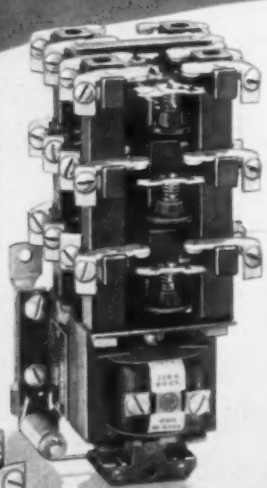
RUGGED
TROUBLE-FREE

BULLETIN 700

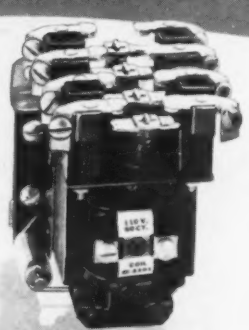
Solenoid Relays

Good for Millions of Operations

A complete line of small, solenoid operated switching units of unfailing dependability. Bulletin 700 solenoid relays have double break, silver alloy contacts that never need filing, cleaning, or dressing. All bearings, pivots, pins, and linkages are eliminated. There is only one moving part. Available in from 1 to 12 poles. Write for complete information.

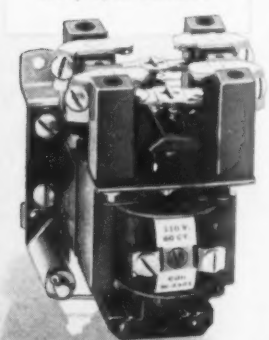


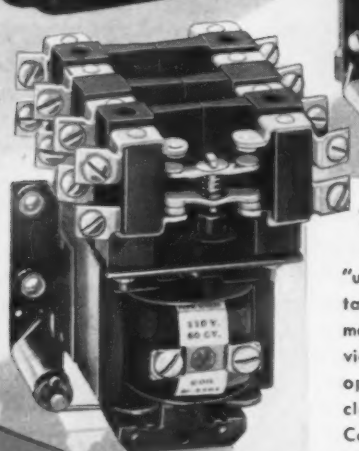
TYPE B-840
12-Pole relay with eight normally open contacts and four normally closed contacts.



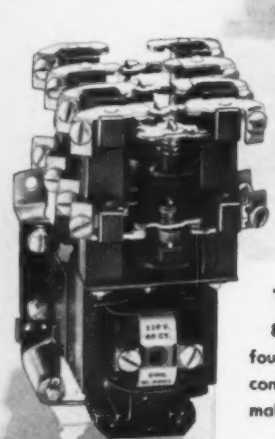
TYPE B-400
4-Pole solenoid relay with four normally open contacts.

TYPE B-200
2-Pole solenoid relay with two normally open contacts.





TYPE B-440X
4-Pole relay with "up-and-down" contacts — any contact may be wired to provide either normally open or normally closed operation. Carry this relay in stock and you'll have the "right" relay on hand at all times.



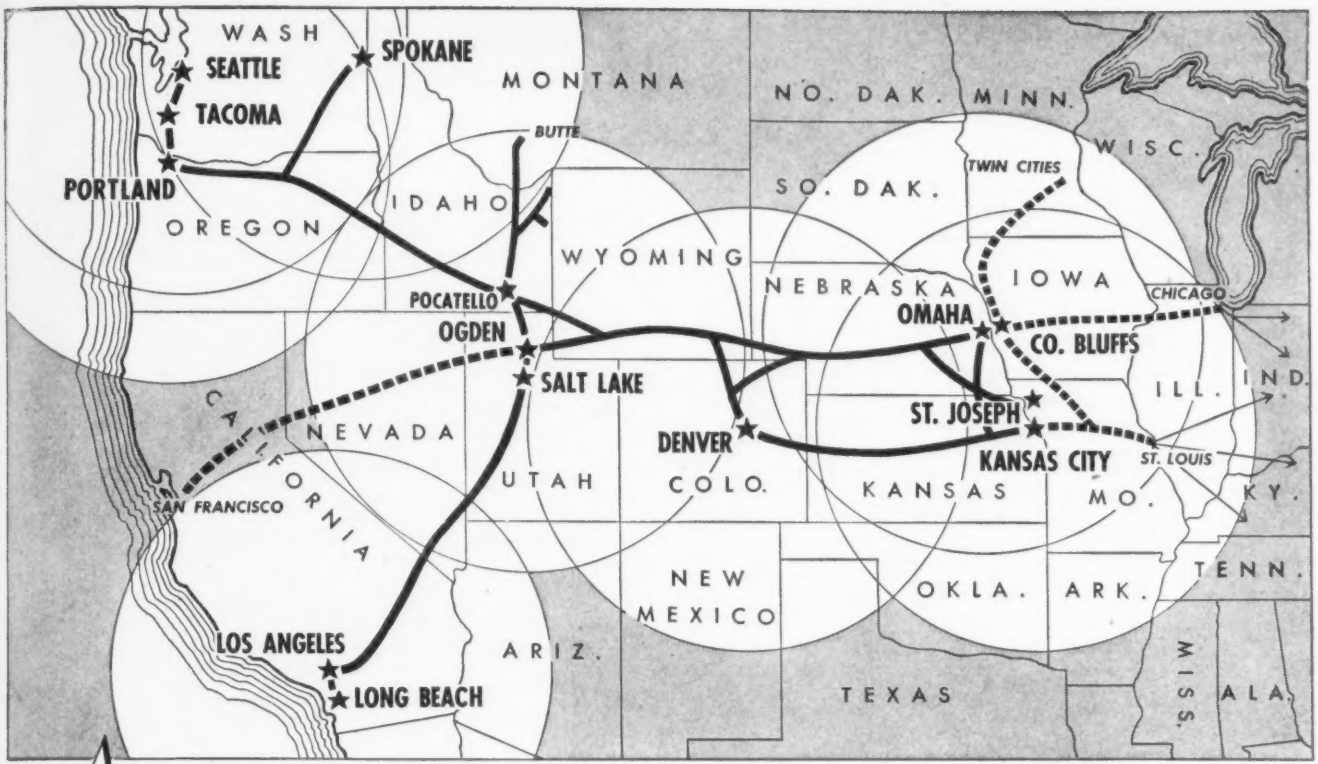
TYPE B-440
8-Pole relay with four normally open contacts and four normally closed contacts.

Allen-Bradley Company
1316 S. Second Street, Milwaukee 4, Wis.

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL

QUALITY

A-B Quality



Opportunity for Industry

The western territory served by Union Pacific is rich in countless raw materials required by industry; has power and other necessary facilities; has a high type of native-born labor. Here lies the opportunity for industry to build and expand.

Among the principal industrial tracts owned or served by Union Pacific are those located in, or near by, the following cities:

Omaha, Neb.	Ogden, Utah
Council Bluffs, Iowa	Portland, Oregon
St. Joseph, Mo.	Seattle, Wash.
Kansas City, Mo.-Kans.	Tacoma, Wash.
(Fairfax District)	Spokane, Wash.
Denver, Colo.	Los Angeles, Cal.
Salt Lake City, Utah	Long Beach, Cal.

As the map shows, all these cities are located on the main lines of the Union Pacific Railroad.

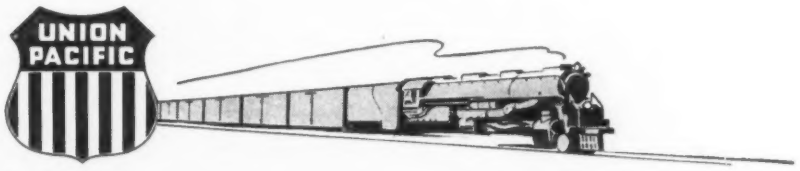
The circles on the map indicate 500-mile distribution areas. In normal times, Union Pacific operates a fast, merchandise freight (L. C. L.) service within these short-haul areas, with door-to-door pick up and delivery service.

These industrial properties are improved and occupied by many diversified manufacturing and commercial enterprises.

Necessary utilities are available and each tract is served by adequate industrial trackage. Whenever required, additional trackage can be provided.

You are cordially invited to write W. H. HULSIZER, General Manager of Properties, Union Pacific Railroad, Omaha 2, Nebraska, regarding industrial districts in territory served by Union Pacific.

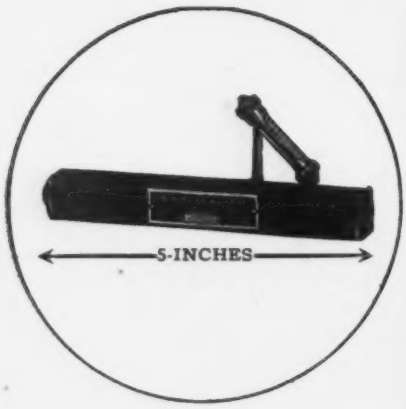
be Specific – say "Union Pacific"



The Progressive

UNION PACIFIC RAILROAD

The Strategic Middle Route



No Fallacious Guesses.

There is no guessing with a Matthews Teleheight. Any lineman can be taught to use it and get any height within an inch or so. He can learn in five minutes.

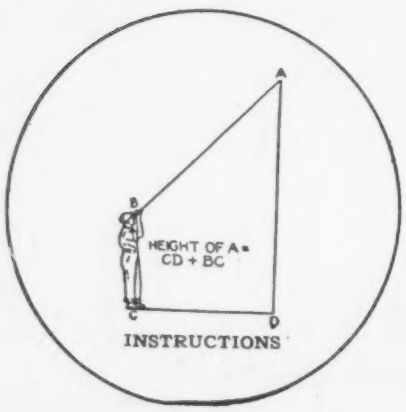
The extra cost of just one wrong guess will pay for one or two Matthews Teleheights. Hundreds of them are saving lots of money for their owners all over the country. Many are being used for quickly figuring the cubical contents of buildings, the clearance of bridges, highlines, etc.

Matthews Teleheight is only five inches long. Has no moving parts. It is furnished with a leather carrying case that will fit in the vest pocket. The drawing below shows how simple are the directions for using it.

Great for Appraisal Jobs.

Try one at our risk of your approval.

W. N. MATTHEWS CORPORATION
ST. LOUIS, U. S. A.



BULLETINS

data books, etc.

Bushing Transformers (522)

Bulletin No. 87 prepared by Pacific Electric Mfg. Corp. describes its bushing type current transformers, designated as Type CP. This transformer is furnished for installation in oil circuit breakers of 115 kv. and above. It is designed for use with standard watt-hour meters and watt-meters having a nominal secondary current of 5 amp. It is furnished as standard in any desired single ratio, including 200/5 amp. and higher.

Copper Alloy Welding (523)

A handbook on copper alloy welding has been issued by C. E. Phillips & Co. It includes a section of definitions, tables and general information, a section discussing common copper alloys and a section on welding and brazing materials for copper and copper alloys.

Germicidal Lamps (524)

"The Lamp that Kills Germs" is the title of a booklet on germicidal lamps, prepared by General Electric Co. Approximately 8¾x5½ in. in size, this booklet contains 32 pages and is well illustrated.

Lighting Equipment (525)

Solar products, including incandescent and fluorescent lamps, cartridge and plug fuses, fluorescent starters and flashlight batteries, are covered in an illustrated catalogue and price list prepared by the company.

Insulation Testing (526)

James G. Biddle Co. describes its "Megger" insulation testing instruments and "Frahm" vibrating-reed frequency meters and tachometers in a 12-page publication recently off the press.

Classroom Lighting (527)

"A Ceiling of Light for Tomorrow's Classrooms" is another in General Electric Co.'s series of architectural lighting design booklets.

Resistors (528)

Bulletin 126, published by Ohmite Mfg. Co., gives information on the company's line of Riteohm ½- and 1-watt non-inductive, pie-wound, plus or minus 1% resistors.

Airport Equipment (529)

Airport electrical equipment is described in a 56-page booklet offered by Westinghouse. Typical lighting plans and wiring diagrams for all classes of airports are included.

Rubber Tapes (530)

A new catalogue section on its lines of rubber tapes and splicing compounds has been prepared by the B. F. Goodrich Co.

Transformers (531)

Allis-Chalmers has prepared a booklet telling the evolution of the modern power transformer and showing photographically how its own shell type transformers are built.

Distribution Equipment (532)

A four-page folder of data on Ohio Brass Co. materials for distribution and farm lines is offered by that company.

Breakers for Railroads (533)

AB "De-ion" circuit breakers for the railroad industry are described in a 20-page booklet available from Westinghouse.

Tachometers (534)

Hanger outlets and floor boxes are described in a bulletin available from Frank Adam Electric Co.

ELECTRICAL WEST, 68 Post St., San Francisco 4, California
Please send me information about following CIRCLED items:

500 501 502 503 504 505 506 507 508 509 510
511 512 513 514 515 516 517 518 519 520 521
522 523 524 525 526 527 528 529 530 531 532
533 534

Name..... Company*..... Title*.....

Address.....

* Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

Because of the basic importance of adequate wiring to the entire electrical industry, Anaconda is presenting messages like this in a wide list of national publications

Trying to Stoke a Furnace with a Teaspoon?

It's just as unwise to expect out-of-date wiring to fully serve modern electrical equipment

Wire ahead!

PRODUCTION LOSSES through obsolete wiring service can run from 25% to 50%...regardless of machine production ratings!

Guard against this needless waste ... protect your investment in new, advanced electrical equipment ... make sure expanded power loads won't exceed your power sources.

Today, put in a call for your consulting or plant power engineer—or for your electrical contractor or power salesman. A discussion with him now may save you many thousands of dollars in emergency alterations, shutdowns later. Anaconda Wire & Cable Company, Subsidiary of Anaconda Copper Mining Company, 25 Broadway, New York 4, N. Y. Sales offices in Principal Cities.

46288

Look to Anaconda for wire and cable controlled from copper ore to finished product by Anaconda basic research and engineering. Every Anaconda product is a lasting investment ...

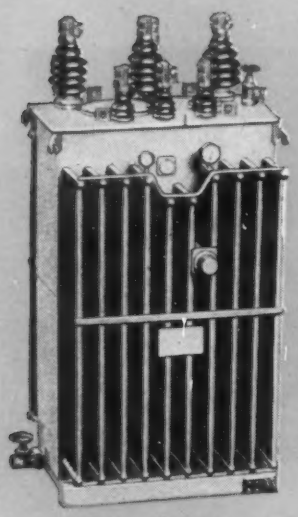
Check your wiring plans before they check you!

DON'T BE PENNY-WISE AND POWER-FOOLISH

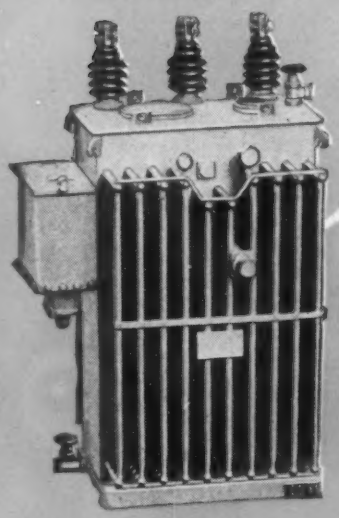
ANACONDA **ANACONDA WIRE & CABLE COMPANY**

ORDERED *Right out of the catalog*

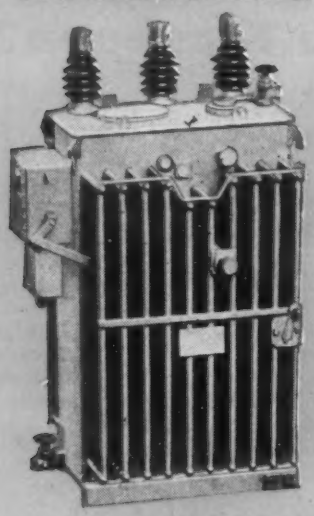
Because G-E "RM-listed" power transformers are built by repetitive manufacture, they open the way to important savings. The wide range of selection they offer (as to auxiliary mechanical features and electrical ratings) meets many of the special needs usually requiring custom-built equipment.



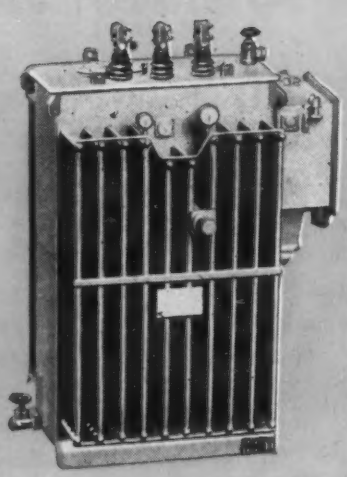
All cover bushings



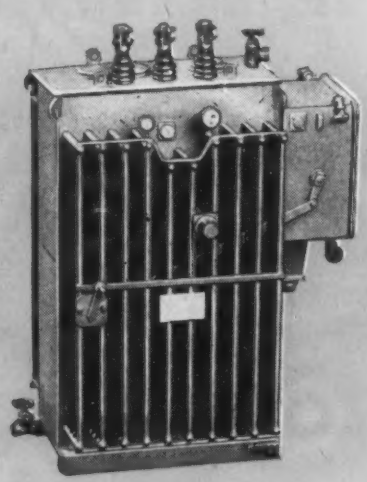
H-V cover bushings
L-V cable entrance without switch



H-V cover bushings
L-V cable entrance with disconnect switch



L-V cover bushings
H-V cable entrance without switch



L-V cover bushings
H-V cable entrance with switch

RM-listings cover step-down transformers in the range of 2400 to 66,000 volts. That your specifications can be met with "tailor made" exactness is demonstrated by the fact that the mechanical combinations shown here, applied over the full range of standard electrical ratings, furnish some 21,000 possibilities from which to make *your* selection.

Savings are also made possible in providing additional margin for load growth and heavy short-time overloads, by using a somewhat larger RM-listed unit, which will cost less than a special "in-between" rating. (A 2500-kva, 22,000-volt RM-listed transformer will cost less than a special 2400-kva, 22,000-volt transformer.)

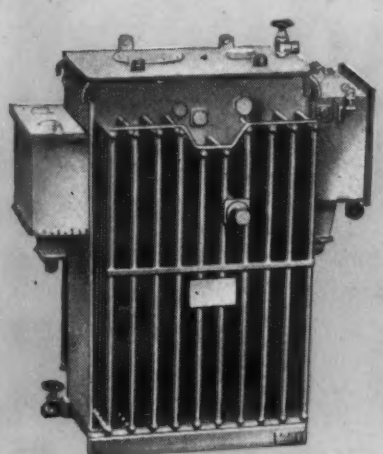
—YET DELIVERED "*Tailor made*" FOR YOUR JOB

You have merely to study the factory-assembled transformer arrangements shown here in order to realize the extent of the logical and practical simplifications which have been made possible by RM design. Installation economies are apparent at first glance.

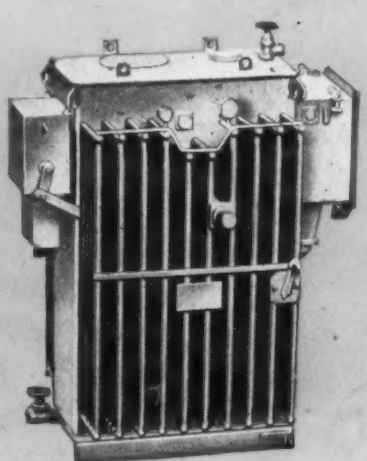
If you are considering the purchase of power transformers in the near future, it will pay you to ask for Bulletins GEA-4283 and GEA-4338A, which will give you complete data on RM design. Call your local G-E representative or write to *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

RM-LISTED TRANSFORMERS

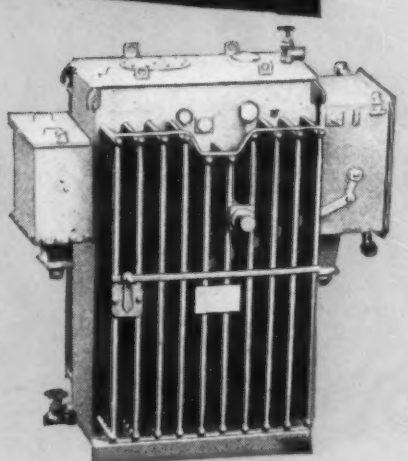
Installation of 3 G-E repetitive-manufacture power transformers with cover bushings.



H-V and L-V cable entrances without switches



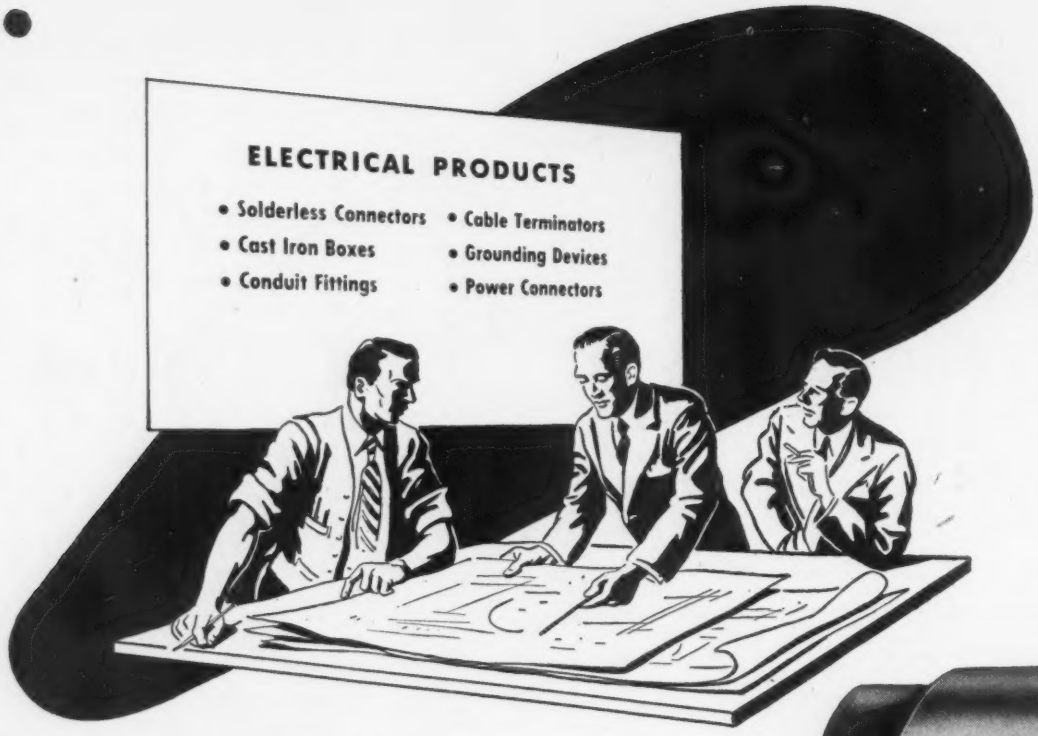
L-V cable entrance with switch
H-V cable entrance without switch

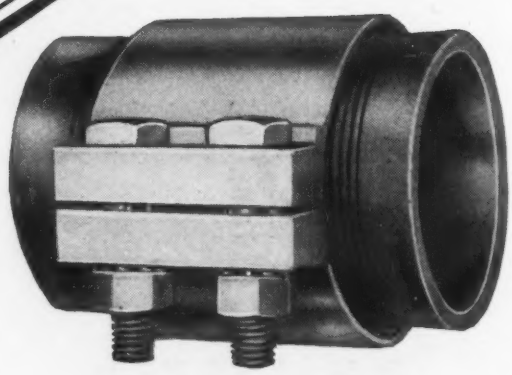


L-V cable entrance without switch
H-V cable entrance with switch

GENERAL ELECTRIC

401-81-5155





SPLIT COUPLINGS... CONTRACTORS SAY THEY'RE O.K.

if they're O.Z.

CONTRACTORS reduce today's building costs TWO ways by specifying Split Couplings by O.Z.

ONE INITIAL PURCHASING COSTS ARE KEPT TO A MINIMUM. The simple one-piece malleable iron construction insures a low priced, high quality product.

TWO INSTALLATION COSTS ARE REDUCED. The Split Coupling is normally spread open so that it easily slips over the ends of the conduits to be joined. Then by merely tightening the nuts, the butted ends of the conduits are fastened together. Note particularly that the only operation required is turning the nuts—the heads of the screws are restrained from moving by the shoulder on the outside of the Coupling.

O.Z. ELECTRICAL MANUFACTURING COMPANY
262 BOND STREET · BROOKLYN, 2 N. Y.

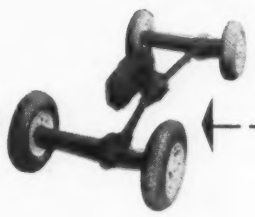
For details on these and other electrical products in the complete O.Z. line, get in touch with your local O.Z. distributor. He's set up NOW to serve your requirements from stock.

Ⓕ 280

FWD... THE *preferred* TRUCK BECAUSE IT'S *Utility Engineered*

FOUR-WHEEL-DRIVE

A "Plus" that Pays in Many Ways!



FWD truck engineering for utilities means that you get more work from every FWD . . . it can handle a wider range and variety of heavy-duty jobs, with greater speed plus safety, for more work-years at low cost! These rugged, dependable trucks get their power, stamina, sure traction and all 'round performance superiority from the true FWD four-wheel-drive principle with center differential . . . maximum power drive equally distributed to all four wheels . . . balanced weight distribution that assures positive traction, greater safety, and equalized working-strain on both driving axles . . . plus other performance-proved advantages of FWD utility truck engineering that has made FWDs the first choice of hundreds of utilities, many of whom operate big FWD fleets. . . . See your FWD dealer, or write for information on FWDs now ready to go to work for you.

THE FOUR WHEEL DRIVE AUTO COMPANY
CLINTONVILLE, WISCONSIN
Canadian Factory: KITCHENER, ONTARIO

FWD TRUCKS

THE ORIGINAL EXCLUSIVE BUILDERS OF FOUR-WHEEL-DRIVE TRUCKS

FWD Distributors: Arizona—Arizona-Cedar Rapids Co., 401 N. First St., Phoenix; CALIFORNIA—The Four Wheel Drive Auto Co., 1339 Santa Fe Ave., Los Angeles 21 and FWD Pacific Co., 469 Bryant St., San Francisco 7; COLORADO—Liberty Trucks & Parts Co., P. O. Box 1889, Denver 1; IDAHO—Intermountain Equipment Company, Broadway at Myrtle St., Boise; MONTANA—Steffeck Equipment Co., 11 E. Cutler St., Helena; NEVADA—Allied Equipment Co., Reno; NEW MEXICO—The Myers Company, Las Cruces; Oklahoma—Halliburton Oil Well Cementing Co., P. O. Drawer 471, Duncan; OREGON—Feenaughty Machinery Co., 112 S. E. Belmont St., Portland 14; UTAH—Cate Equipment Co., 49 E. 9th So., Salt Lake City; WASHINGTON—Feenaughty Machinery Co., 1028 6th Ave., So. Seattle 2, Glenn Carrington & Co., 91 Columbia St.,, Seattle and Feenaughty Machinery Co. 715 N. Division St. Spokane; WYOMING—Wortham Machinery Co., 517 W. 17th St., Cheyenne; ALASKA—Glenn Carrington & Co., Nome, Fairbanks, Anchorage.

These are "Musts" in Fluorescent Lighting

FLEX-LOC
Lamp Holder

FLEXIBLE: Automatically self-adjusting to variations in length of lamps and spacing of mounting holes. Engineered to fit all standard spacings.
AUTOMATIC LOCK is positive. No extra locking devices are needed. Lamp cannot fall out.
EASY INSERTION AND REMOVAL of lamp. No twisting. No turning.
PERFECT ELECTRICAL CONTACT: Brass contacts grip BOTH sides of lamp pins securely.

Listed and Approved by
UNDERWRITERS' LABORATORIES INC.
E.T.L. Test Report No. 314454 Is Available

This Starter
AUTOMATICALLY
Cuts Out

- " " deactivated or flickering lamps.
- " " current to lamp and ballast.
- " " high maintenance costs.
- " " high power consumption.
- " " short lamp and ballast life.

AUTOMATICALLY
Resets

- when new lamp is inserted.
- without fussing with starter.

PLASTIC CAN has greater dielectric strength. The boldly knurled rim makes insertion and removal easier, and there are no projecting lugs to cause trouble. The can is SEALED.

Listed and Approved by
UNDERWRITERS' LABORATORIES, INC.
Certified by Electrical Testing Lab., Spec. 6

LLOYD PRODUCTS LEAD

BECAUSE Lloyd has set up engineering specifications more rigid than the accepted standards.
BECAUSE only the best materials are used in their construction.

LLOYD POLICY INSURES QUALITY
LLOYD PRODUCTS CO.
73 Gordon Ave. Providence 5, R. I.
Branch Offices and Warehouses in 27 Leading Cities

BOOKS
you may want

ATOMIC ENERGY FOR MILITARY PURPOSES, by Henry D. Smyth, 308 pages, 5½ x 8, index, illustrated, Princeton University Press, cloth, $2, paper $1.25, sixth printing.

A republication of the original Smyth report issued Aug. 12, 1945, with the following variations, (1) minor clarifications and corrections in wording; (2) inclusion of a paragraph on radioactive effects issued by the War Department to accompany the original text; (3) addition of a few sentences on the success of the health precautions; (4) addition of a few names; (5) addition of appendix six giving the War Department release on the New Mexico test of July 16, 1945; appendix seven giving text of a statement by the British Information Service and appendix eight giving text of a release by the Canadian Information Service; and (7) inclusion of an index.—W.C.H.

☆

ELEMENTARY ENGINEERING ELECTRONICS, by Andrew Kramer, managing editor *Power Plant Engineering*, Instruments Publishing Co, Pittsburgh, $2.

This book is a successful attempt to present the basic principles of electronic tubes and circuits to that great middle class of readers in industry who look upon electronics as a practical aid in control and measurement rather than as a fascinating hobby on the one hand or a scientific excursion on the other. Obviously designed for serious readers, the book circumvents the complicated mathematics which usually fences off the non-mathematical from an intimate comprehension of the subject. Clever mechanical analogies are used to clarify the action of electron tubes. The "mechanical thyratron" is a particularly ingenious contrivance employed effectively by the author for this purpose. Special reference is made to the applications of electron tubes in the field of instrumentation, the last eight chapters being devoted entirely to this phase. Thus the book should appeal to a wide readership of technicians in manufacturing, industry, public utilities and engineering education. The book is of handy 5x8¼ in. size, the 34 chapters are each short and single-minded, and the illustrations and diagrams plentiful and well executed. A book for busy men who want their time and money's worth when they read.—G.N.H.

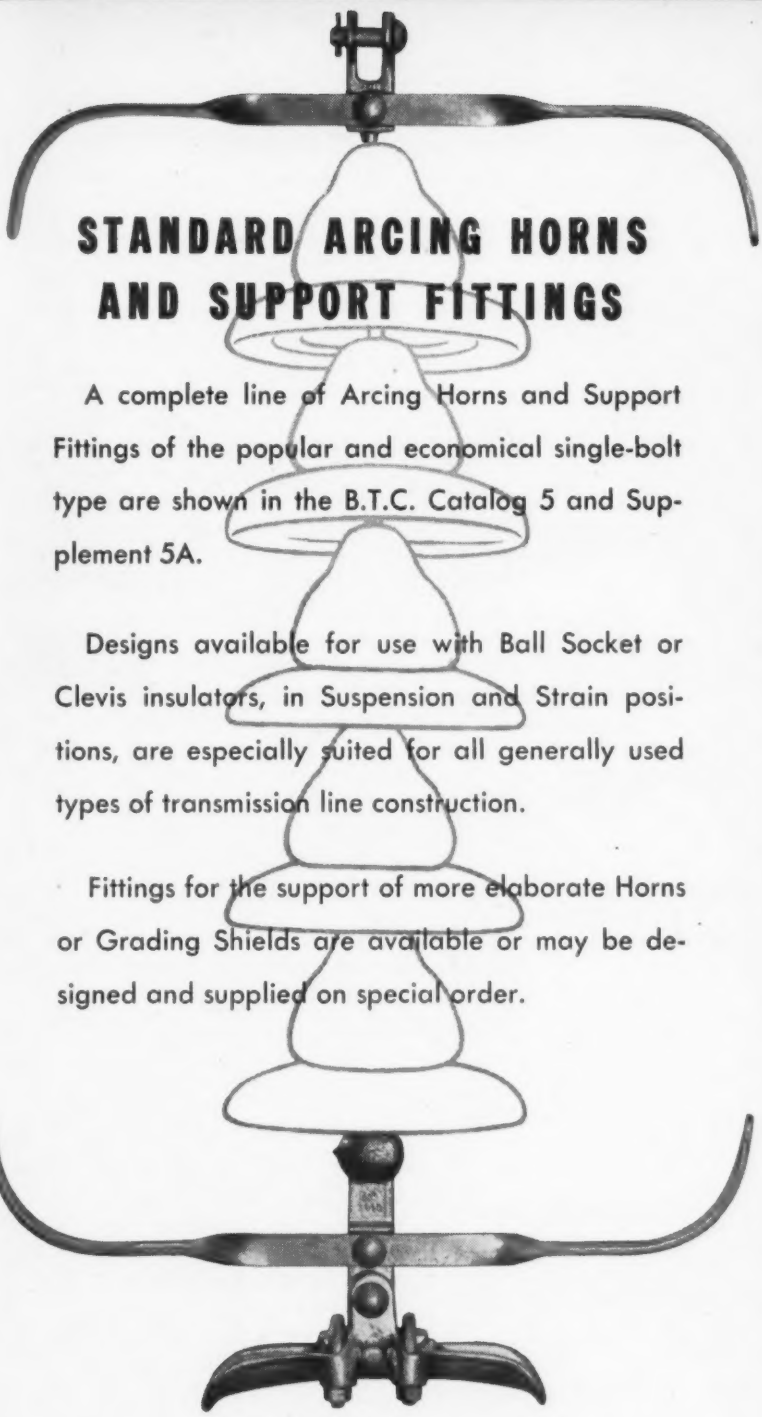
☆

ELECTRICAL MEASURING INSTRUMENTS, MEASUREMENTS AND SURVEYS, by Edwin S. Lincoln, published by Essential Books, New York, as one of its Modern Electrical Series.

This volume covers not only the construction, use and care of electrical instruments, but their practical employment in industrial plant efficiency work. Practical suggestions for the organization of the electrical departments of industrial plants are included as well as pointers on the modernization of the electrical system. Important features of the book are the detailed directions for the conduct of surveys of load, power factor, voltage, lighting, wiring, protection and electrolysis. Electrical instruments for every purpose in the industrial plant are fully described and adequately illustrated. Especially valuable is the discussion of instrument transformers and instrument burdens. Lists

(Continued on Page 48)

FOR TRANSMISSION LINE DESIGN USE BTC STANDARD DROP FORGED FITTINGS

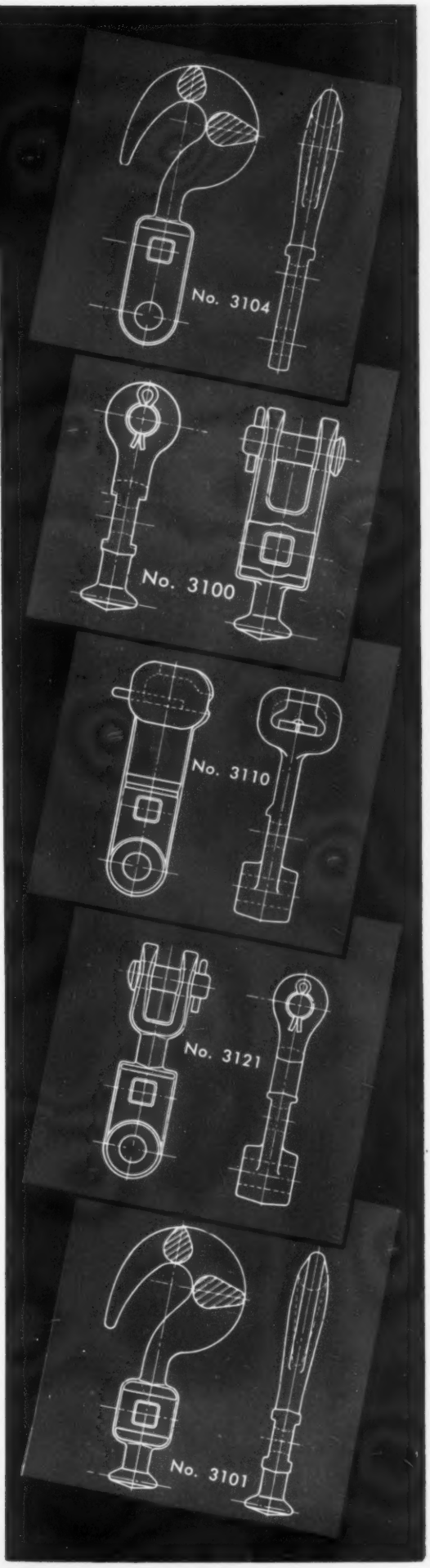


STANDARD ARCING HORNS AND SUPPORT FITTINGS

A complete line of Arcing Horns and Support Fittings of the popular and economical single-bolt type are shown in the B.T.C. Catalog 5 and Supplement 5A.

Designs available for use with Ball Socket or Clevis insulators, in Suspension and Strain positions, are especially suited for all generally used types of transmission line construction.

Fittings for the support of more elaborate Horns or Grading Shields are available or may be designed and supplied on special order.



Sold only through your insulator manufacturer

THE BREWER-TITCHENER CORPORATION
CORTLAND, N. Y.

The New HARVEL 912-C
Internal Curing INSULATING VARNISH

Cuts CURING TIME UP TO 50%

Compare These Schedules with YOURS

912 C Curing Schedules
(Standard convection ovens)

2-4 hours . 285 deg. F.

3-5 hours . 260 deg. F.

4-6 hours . 250 deg. F.

(all curing times lower with infra-red equipment)

Here's a new insulating varnish, recently developed by IRVINGTON, which cuts curing time substantially! It is used with *existing equipment.*

Compare your present schedules with the baking times given above. Then estimate the savings in costs as well as the increased output. And remember, you can effect these savings without investing in equipment.

Moreover, 912 C provides *greater storage stability* and *shelf life,* yet has all the outstanding electrical and physical advantages of other HARVEL internal curing varnishes. For complete information, and samples, write to Dept. 44. Irvington Varnish and Insulator Company, Irvington 11, New Jersey.

Irvington Products *Include*

Cotton, Fiberglas, or Rayon Tubings and Sleevings — Varnished, Lacquered, or Vinylite Processed
Non-Fraying Fiberglas Sleeving
Transformer Lead Tubings
Wire Identification Markers — Varnished or Plastic
Extruded Plastic Tubings
Fibron Plastic Tapes
Varnished Fabrics and Papers
Slot Insulation
Harvel and Irvington Insulating Varnishes
Cardolite Resins

STANDARD OF THE WORLD IRVINGTON INSULATION REG. U.S. PAT. OFF.

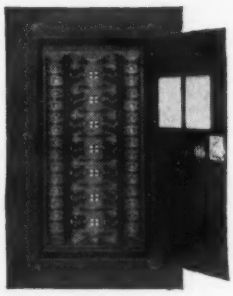
IRVINGTON

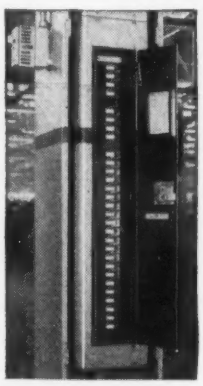
VARNISH & INSULATOR CO., Irvington 11, New Jersey

First in Quality and Safety

BULLDOG *SUPERBA* AND *CIRCUIT MASTER* PANELBOARDS

Superba Lighting Panelboards comprised of symmetrically designed bakelite units incorporate more improved operating and safety features, greater flexibility for all wiring systems and finer appearance than is procurable in any other Panelboard. Available in panel sizes ranging from 4 to 40 circuits.





Narrow Column Type Circuit Master (circuit breaker) Panels 8½" wide or less for installing between the flanges of H columns . . . saves usable working space. Special design features simplify installation problems, cut wiring time and reduce wire and conduit runs. Available in panel sizes from 6 to 32 circuits.

BULLDOG *Vacu-Break* SAFETY SWITCHES WITH "CLAMPMATIC" CONTACTS

As industry reconverts to competitive peacetime production, manufacturers—large and small—are insisting on the best circuit protective devices available *to keep power on the job.*

That's why the demand for BullDog Vacu-Break Safety Switches with "Clampmatic" Contacts has now reached a new all time high.

First in the field — in quality and safety — the many advanced and exclusive features of these BullDog switches will help you speed production and reduce maintenance costs by carrying your loads more safely and efficiently.

BETTER FOUR WAYS

1. Formed "Bakelite Arcing Chambers" confine and suffocate arcs.
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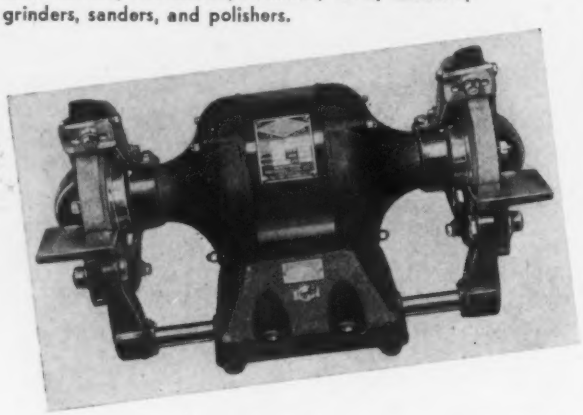

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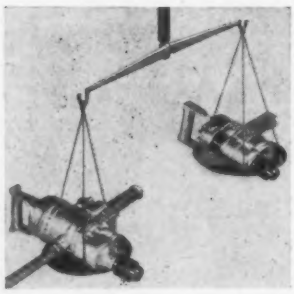

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(Continued from Page 42)

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AIEE STANDARDS, prepared and published by the American Institute of Electrical Engineers, other details as indicated below.

Electrical Installations on Shipboard, AIEE Nos. 601 and 602, May, 1945, eleven pages, 30c. A joint venture with the mechanical engineers, confining itself initially to ratings between 11,500 kw. and 60,000 kw.

Expulsion Type Distribution Lightning Arresters, AIEE No. 47, December, 1945, cost not given. A proposed standard for trial use, excluding arresters furnished integrally with transformers.

Test Code for Synchronous Machines, AIEE No. 503, June, 1945, 42 pages, 60c. The code as finally adopted, one of a series endeavoring to establish test codes for all the principal electric machines.

LETTERS

to the editor

TO THE EDITOR:

My apologies for not sending for these bulletins sooner, but we experience some little difficulty in getting our hands on your magazine up here. However, I am renewing all my contacts in the electrical field pertaining to commercial and industrial lighting applications with the intention of returning to that business in the near future. That includes membership in IES.

Since my mind has been working along these lines, it has been strongly drawn to my attention that many worth-while things might be done here in Alaska with newly developed equipment. For example (and this is not meant for a laugh) has anyone ever used a bank of drying lamps—some of the new infrared series—for curing hay? That is one of the great unsolved problems of all dairymen up here, for the reason that at the time their forage is cut for hay there is almost unending fog and rain, and curing of the crop is almost impossible. That goes for Matanuska Valley also. As a consequence, all these farmers have been forced to resort to shipping in feed from the outside. A slow-moving conveyor belt could be used to carry the hay through, much like an assembly-line set-up in a plant. Also, the high incidence of tuberculosis in the Territory among both white and native population might be substantially reduced by proper application of germicidal lamps. These are only two of many special problems in the Land of the Long Night which light could play a major role in solving.

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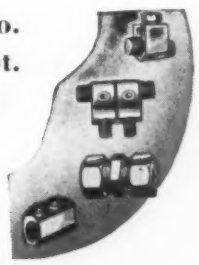

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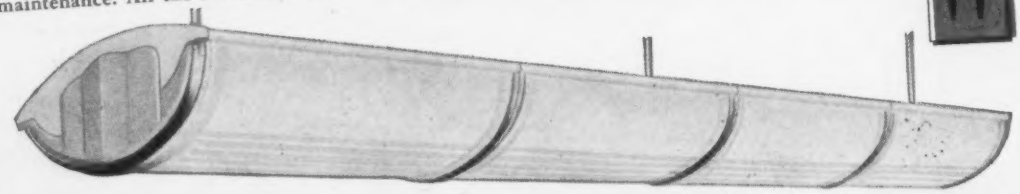

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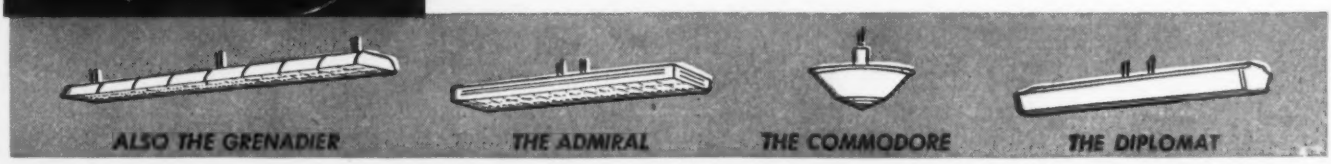

ALSO THE GRENADIER THE ADMIRAL THE COMMODORE THE DIPLOMAT

ELECTRA'S HUSBAND

Need a Pressure Group?

"IT'S A hell of a note," our guest said, "when a man has to spend three-quarters of his business life fighting for the preservation of his company rather than building it into a progressive, substantial community enterprise. But that's the way it has been for some of us in the power business—fighting and crusading to save private enterprise."

"Why do you do it?" Electra asked.

"Sometimes I wonder myself," our guest replied. "Maybe it's for the principle of the thing. Maybe it's because of a hope to preserve the system we believe in. Maybe it's to turn a going, tax-paying business to the fine people who are working in our organizations. Maybe it's because as rugged Americans we love a scrap. But it's tough and getting tougher."

"A lot of us are wondering where do we go from here," I interposed. "Frankly we get disturbed when we see how socialism and communism are spreading throughout the world."

"That's a question which is puzzling every real American today," our guest said. "In my humble opinion, all private enterprise in this country is menaced and threatened by government regimentation and a planned or controlled economy of one kind or another. We have price-fixing, all sorts of subsidies, managed currency and social planning."

"I'll subscribe to all of that," Electra interrupted. "We've been planned into a state of absolute confusion and it is getting worse."

"Part of it is because in government, we have gone from a constitutional republic to the kind of democracy where the votes of organized groups of our people are traded for preferential treatment and favors by the elected officials of government. Our national economy is not one predicated on sound economics—it's based on politics and votes. There exists today a mad scramble for privileges among pressure groups. The situation is just dynamite to the American way of life. And it can't be laughed off. We just have to be realistic about it."

"Why don't some of the rest of us organize pressure groups?" I asked.

"How can one executive, or one engineer or one white-collar worker set up a pressure group?" our guest countered. "But there are a couple of segments of our economy that might be effectively organized. They are the security holders and the white-collar workers. They are the forgotten men and women of our times. If the vast numbers of these two groups do not become fully organized, function militantly and bulk large in voting strength, it is very doubtful whether private enterprise can be preserved in anything like its most productive form. The articulate, organized groups are and will continue to run roughshod over the unorganized."

"The sad thing about *homo sapiens* is that he apparently can't learn from the experience of others," Electra commented. "We never really appreciate a thing until we are about to lose it."

"That's right," our guest continued. "Bit by bit private enterprise is kicked overboard, and a lot of people will be sorry only when the funeral is over. Sometimes I think private enterprise is its own worst enemy. There is too much of the dollar sign and not enough group action and sticking together. There is definitely too much lip service given to the cause of private enterprise and not enough actual work done or sacrifices made to preserve it when its existence is threatened. There isn't the zeal and fervor put into the preservation of free enterprise as there is in the destruction of it. Everybody is for saving private enterprise if it doesn't cost anything. A real selling job has to be done in getting over to the so-called 'common man' what private enterprise means to him in the way of better living. I know that's trite, but it's true nevertheless. Some way has to be found to make private enterprise a warm, vital, human living thing. Surely a system which has contributed so much to the welfare of man can be sold on its merits."

"Then let's have us a pressure group," said Electra blithely, as if that would settle the whole thing quick. It seems the thing to do if we are to protect ourselves from others so organized."

"I suppose if we did we'd be labeled fascist and accused of trying to enslave the poor workingman. Without examining into the reasonableness of what we advocate our organization would be covered with an avalanche of emotional counter appeals and epithets, of lies and half-truths," I meditated. "First thing we knew we'd be defending a position at all costs, sometimes at cost of our intellectual freedom.

"That's the trouble with organizations. They have to, or think they have to take a stand, hold an attitude. To do so shuts out all analysis. You can't be a partisan and keep freedom of mind and thinking too. You choose a side and have to defend that side, right or wrong. One reason our level of thinking people does not organize is that we want to be free to select rather than accept the party line.

"And another thing we fear is that even our organization may develop power that tempts our leader to misuse, sweeping us along with him."

ELECTRA handed me a clipping the other day without any comment from her (which is rare indeed). It was titled *The Taxpayer's Primer.* Here is its text:

"What is a bureaucrat?

"A bureaucrat is an individual, generally a theorist, placed in power in bureaus of government that start where legitimate, useful administration leaves off.

"What does he do?

"First, he draws a fat salary paid by you and me, next he sets up offices all over the country to employ large staffs (also paid for by us). Third he sits up nights devising regulations to entrench his bureau in power and regiment the business and lives of our citizens. Next he draws up forms galore for you to make out when you wish to can fruit, build a house or whatnot, then he starts the printing press rolling them out by the ton (despite the need for paper saving.)

"What is the net result?

"Confusion, delay, distress and stagnation in business and every normal activity.

"What is the bureaucrat's philosophy?

"That people are moronic, that they have to be told what to do and what not to do and how to do it?

"What is bureaucracy?

"A super-government within the government, founded not upon law, but created by executive order born of political and war emergencies and allowed to grow like cancers on the body politic."

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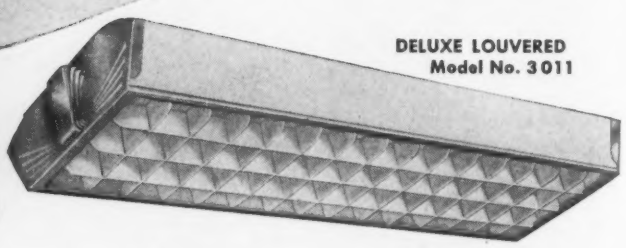

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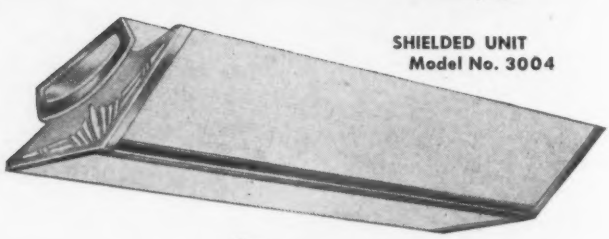

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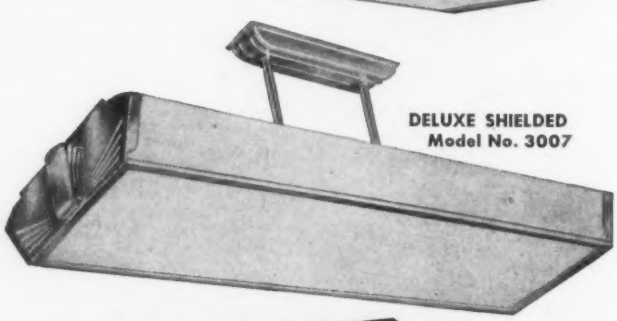

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ELECTRICAL WEST

MAY, 1946
VOL. 96 NO. 5

YOUR FRIENDS ARE ON YOUR PAY ROLL

Alfred M. Cooper

IN too many instances, not only the industrial worker, but his boss as well, feels that the public relations of his company is something that is taken care of in the front office. He believes that the attitude of the public toward the organization employing him is determined primarily by the quality of the various types of formal publicity disseminated by that company.

As a matter of fact, however, publicity—in the form of press releases, editorial material, billboards, public addresses and radio talks—ranks a poor fourth among the factors that influence public attitude toward any company. It is further true that the foreman or office supervisor in any company, in discharging his daily duties as the immediate superior of the worker, can strongly affect two factors influencing public attitude, either of which outranks publicity in importance. (It should be understood that we are here discussing the public relations of an organization—manufacturing plant, store, public utility or bank—in the community in which the concern in question is doing business. It is this local public opinion that is becoming increasingly important in determining public attitude toward private enterprise.)

So far as any community is concerned, there are six factors that influence public attitude toward any industrial or commercial organization in its midst. These factors, in the order of their importance, have been found to be:

1. The physical service rendered by the company.
2. The personal contacts of the employees of the company.
3. Rates or prices.
4. Publicity.
5. Appearance of buildings and equipment.
6. Financial success of company.

Glancing at this list, it at once becomes obvious that the worker's activities, on and off the job, have more weight in determining public attitude toward his company than can any conceivable effort exerted within a public relations or publicity department. The two most important factors influencing public attitude are physical service (the quality of the product or service produced and marketed by the organization) and the personal contacts of the employee (the impression created on the public when any employee of that concern contacts, in or out of working hours, any member of the community not employed by the company).

It is not difficult to see how the individual employee, in the daily discharge of his duties, largely controls these important methods of influencing public good will. The quality of the service or product that constitutes the company's reason for being in business depends to a considerable extent on the efficiency of the working force, and hence upon the type of supervision these workers receive. As we shall see, the multitude of contacts made by the employees of any organization with the public reflects to a considerable degree the training these people have received from their superiors. Thus the two most important factors influencing public attitude toward any company—physical service and personal service—depend for their functioning largely upon the intelligent efforts of the immediate superiors of those who make up the working force.

Rates charged for service, or prices charged for manufactured product, are matters determined by management, and the workers or supervisory force ordinarily have little to say about such affairs. The same conclusion applies to those formal means of publicity previously listed, all of which emanate from the front office.

Appearance of buildings and equipment, as a factor influencing public attitude, depends to a considerable extent on the degree to which the supervisory force of any organization is up on its toes. Under this heading come design of buildings to harmonize with the surrounding neighborhood, landscaping of buildings in residential sections, condition and appearance of automotive equipment, and the degree to which all of these factors reflect credit on the company in question. Obviously, appearance of buildings and equipment is largely dependent on effective workmanship and good supervision.

The impression the public receives of the financial success of any company appears to influence in some degree the attitude of the public toward that concern. While this is not one of the more important factors in determining public attitude, it would appear that people prefer to do business with a concern that does not give the impression that it is about to go out of business because of mismanagement.

Those supervisors of clerical and sales employees whose duties are largely of a public contact nature appreciate full well their responsibility for creating good public attitude through improved employee performance. In this case the supervisor's job is that of so training and supervising each contact employee that his or her service to customers is of a sort that will make friends for the company. Under the strain of labor shortages and the general cantankerousness of a people engaged in prosecuting a great war, there developed in our commercial organizations a sharp decrease in the quality of personal service among nearly all contact employees. Now is the time to set about remedying this situation. Lack of courtesy that was over-

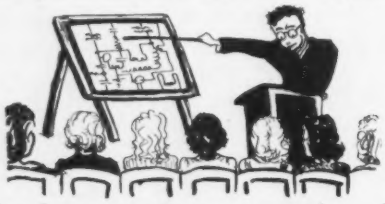
looked in wartime will not be so readily excused by the public in peacetime. Public contact training has been in effect in so many industrial and commercial organizations in peacetime that it is unnecessary to go into detail here regarding methods.

However, when the subordinates of a supervisor happen to be individuals who make no contacts whatever with the public during working hours, it is sometimes difficult for the supervisor and the worker to appreciate that they have a distinct responsibility for the sort of reports about company affairs that are disseminated by employees *after* working hours. It is a fact repeatedly proven by public attitude surveys that this word-of-mouth publicity of employees has more bearing on the local public relations of an organization than has all the formal publicity issued by the public relations division of that company. The reason for this should be obvious.

When the public reads the paid publicity of any company, it does so with the foreknowledge that this information is going to be favorable to the company's interest; therefore, there is a tendency on the reader's part to view this type of publicity with some skepticism. But when a citizen of the community is told certain facts by an employee of that company, he feels that this information can be given credence because the employee, so far as he can see, has no axe to grind. This situation remains unchanged even though the employee is talking about something concerning which his information is extremely meager and largely inaccurate. Particularly is this true when the employee is attempting to interpret to his neighbors some phase of the managerial policy of his company. If the employee is questioned concerning matters of which he knows nothing, it is natural for him to dislike to admit ignorance, and he will therefore often invent information that would definitely be news to the management of his concern, or repeat as fact unfounded rumors he has heard on the job, but which have no foundation in truth.

When management awakens to the fact that careless talk on the part of the lowliest employee in the plant can more than offset the most beautifully conceived publicity campaign, action is usually taken to correct matters. Sometimes this action takes the ineffective form of futile admonitions to employees to be sure of their facts before circulating among their friends reports that have to do with matters of company policy. A more thoughtful management, however, sees the value of taking the working force into its confidence to a greater degree than formerly, and takes the necessary steps to ensure that every man and woman in the organization is kept informed of the *truth* of matters that are important to the welfare of the company.

For a good many years it has been common practice in many large plants to give employees brief courses of instruction covering the functions of departments other than their own; this training having for its purpose the improvement of the employee's understanding of just how his or her work fits into the big production picture of the plant as a whole. The informa-



tional courses I am suggesting, designed to improve the employee's knowledge of matters pertaining to company policy, may be conducted in much the same manner as are those courses that deal with a study of the organization and functions of the various divisions comprising the company. As a matter of fact, the latter type of course forms a most excellent groundwork for the public relations training course that is to follow.

The purpose of any public relations training course for non-contact employees is simply that of making sure that every employee of the company understands the *truth* about certain fundamental phases of company policy which he will in all probability discuss with his friends outside of working hours, whether or not he has authentic information on these subjects. It is vitally important that all information thus put over to the employee be truthful, accurate, and complete, and that no attempt ever be made to mislead the worker. Once the employee learns that he can depend on this information, he will gladly disseminate it, much preferring to speak with authority on matters with which he has been made familiar than to invent stories to cover up his ignorance of these matters when questioned by his friends.

By far the best method of conducting such a training program is that of scheduling a series of conferences, conducted either by the immediate supervisors of the employees concerned, or by staff training men, in which each worker is given an opportunity to discuss matters pertaining to company policy. Participation in such discussions has the dual effect of clarifying these matters in the employee's mind and also of selling him on the idea that he has a definite responsibility for improving public relations.

Labor leadership is fast learning that the interests of workingmen cannot be served by injuring the company that employs these workers. I have found that unions cooperate to the fullest extent in any program designed to improve the company's public relations. On the other hand, it should be unnecessary to suggest to management that the better its industrial relations happen to be, and the more satisfied its employees, the better will be the cooperation of these employees when they are asked to give the public an accurate and favorable picture of what the company is doing and plans to do.

In administering a training program of this type over a period of years, in an organization employing some 10,000 people, I have found it entirely practicable to make definite assignments to the entire working force of specific information that should be disseminated to the friends and neighbors of these employees. It goes without saying that this information, while wholly favorable to the company's interest, must in every instance, be altogether accurate and truthful. Any effort made to hoodwink the employee in these matters will terminate the usefulness of such a program, once and for all.

With this reservation in mind, there is no limit to the subject matter that may be discussed in the employee conferences. Every employee of the company is familiarized with details of company policy and understands the reasons behind the company's attitude in these matters. Furthermore, to the extent that he is called upon to defend his company to outsiders, he develops a feeling of loyalty toward it.

This is a time when management must do everything in its power to improve the relationship of the company with the public it serves. It is equally important that management improve its relationship with its own working force. The public relations training program briefly outlined here has been found to be remarkably successful in obtaining this dual objective.

Self-Correction by Industry

Edison engineers at Vernon work out a method of presenting power factor studies to customers, whereby benefits of consumer capacitance are clarified

D. K. Grandey

Power Sales Engineer, Southern California Edison Co., Ltd.
Vernon, Calif.

LIKE many industrial areas, Vernon (Calif.) displayed a variety of changes in electric load throughout the war. Primary feeders, substation transformers and customers' plant wiring became overloaded. Many of the demands were high in kva. and low in kw., with the result that the problem of dealing with wattless current became unusually important.

Capacitors installed by industrial customers made an important contribution to the solution of this problem. It was found that utility studies of the customers' problems frequently brought to light the fact that capacitor installation would be to the customer's advantage. Since similar cases will be encountered in the postwar adjustment period, and since the principles are applicable in many areas, certain features of the Vernon experience may prove valuable elsewhere.

The city of Vernon owns its own distribution system, which is leased to and operated by the Southern California Edison Co. Within this 4-sq. mi. service area about 1,000 electric customers have a total connected load of 200,000 hp., excluding lighting. Nearly every type of industry is represented, from glass manufacturing concerns with high load and power factors to job shops with the opposite characteristics. The over-all power factor of the Vernon system approximates 80%, with peak demands of 87,000 kva. When these plants expanded rapidly, large electrical loads were frequently added with little or no advance notice. Such events served to expedite one part of the power-factor correction program.

Take the case of large plants using many m-g arc welders. As a rule these welders were added a few at a time without notice being given the utility, and without appreciable effect on kilowatt demand. As a result it was blowing of fuses or data from meter tests or current charts which indicated that the utility was confronting the necessity of providing larger transformers.

By the time this discovery was made it was usually necessary to do something at once. But the possibilities of getting transformers installed within any reasonable time were usually remote. In the first place, these troubles usually accompanied a rush of other new business; it was not feasible to drop the work of getting service to new customers to install new transformers elsewhere. In the second place, the change would usually require going from a platform pole station to a customer's ground station, a procedure requiring ten days to pour and set the concrete plus six to eight days to build the station. In the third place, larger transformers and service cable were not always available.

The solution to these difficulties was frequently found in analysis of the customer's problem. Frequently the customer, by using capacitors, could correct his own troubles at less cost and in less time than the utility would have been able to, even had it been in a position to act at once.

For example, since most of these loads would no doubt prove temporary, it would be necessary for the utility to collect an installation and removal charge for the transformers, a charge which would often exceed $1,000. The customer would eventually have to write this off as an expense without actually having improved wiring conditions on his load side of the meter. To realize the benefits of the added transformers, the customer would usually have to increase the number of feeders in his plant as well as install larger switches. There was also the cost of the concrete pad.

From the utility standpoint, station investment would often have to be doubled in order to take care of the wattless current.

To determine how these costs would compare with other corrective measures, a power-factor check was made at peak load, and recommendations for correction were based on the demands thus revealed.

Table I shows a series of such checks. In August 1944 this customer notified the utility of his intention to add 600 hp. in m-g welders prior to 1945. He was accordingly served by a group of three single-phase transformers on a rack, giving him 450 kva. Installation of this amount of capacity was based on a 30% demand factor at 40% power factor on the anticipated 600-hp. increase. The customer advanced the usual installation and removal deposit which is subject to refund at the end of three years.

Table I

Date	Connected Load (hp.)	Served by (No. and Kva.)	Demand (Kw.)	Power Factor Normal	Power Factor Corrected	Type of Load
July 26, 1944.....	178	Transformer 28 serving other customers				Compressors, etc.
			28	60%		
Feb. 19, 1945.....	778	3-150	267	40%	60%	80% welders
May 21, 1945.....	1,038	3-150	402	40%	80%	90% welders
Aug. 21, 1945.....	1,200	3-150	*490	40%	80%	90% welders
Sept. 19, 1945.....	274	3-150	34	60%		Compressors, etc.

*Note—The 490-kw. demand was for a 15-minute period and occurred on the average of twice daily. The usual demand during this period of maximum use was about 410 kw.

As Table I indicates, welders were gradually added and the demand gradually rose. In February 1945 the customer installed 270 kva. in capacitors which corrected the power factor to 60%. In August he added another 90 kva. Had the utility followed these increased kva. demands with transformer changes, the cost to the customer would have been approximately $2,400. The customer's actual cost of capacitors less the amount received for their subsequent sale was $600. In addition to this saving, the original plant wiring proved adequate and no shutdown was necessary. Capacitors were purchased, delivered and installed in 48 hours.

In another plant which experienced the same rise in demands a 7½-kva. capacitor was installed on each of the first 20 welders. This method of cor-

Table II

Circuit	Time	Voltage	Current, each phase A	B	C	Circuit Load (kw.)	Power Factor	Kva. of Capacitors to Correct to: 80%	90%
1	11:30	458	528	504	504	250	62	132	203
Panel B	11:38	458	276	276	276	96	46	123	138
Panel D	11:48	467	105	170	170	127	99.8	...	...
Panel D	12:18	459	192	252	276	180	99.4	...	...
Panel A	12:32	458	134	136	96	67	64.0	30	48
Bldg. No. 4	12:35	457	305	307	305	125	72	27	61
Bldg. No. 5	12:47	455	158	144	149	106	87	...	...
						Total		312	459

OVER-ALL PLANT LOAD AND POWER FACTOR

Time	Plant Load Kw.	Rkva.	Power Factor	Capacitor Kva. To Correct To 80%	90%
11:30	914	814	74.7	104	366
11:38	869	824	72.6	174	405
11:48	530	230	91.8		
12:18	893	869	71.7	201	438
12:32	893	820	73.6	105	388
12:35	817	814	70.7	204	420
12:47	817	769	72.8	159	372

rection proved unsatisfactory for the following reasons: An average of three of these welders per day was taken off the line for repairs, thus removing 22½ kva. of corrective capacity; staggered lunch hours caused others to be taken off the line; some of the machines were not in use until 10 a.m. As a result, the average power factor for a month was 20% below expectations. The second installation of 180 kva. in capacitors was made on individual plant feeders. These were allowed to stay on the line whenever the plant was in operation. Results were very satisfactory.

An outstanding emergency case involved a large plant operating at 230 volts. A 4,000-amp. main switch had been damaged by overloads. The obvious solution would be conversion to 460 volts, but unfortunately no shutdown could be taken. A check at peak load showed power factor to be less than 40%. Recommendations were made giving the kva. to be installed on each plant feeder, a total of 750 kva. The switch was taken out and repaired and capacitors were then installed. The customer's saving (not counting avoidance of shutdown) was $29,000.

The second part of the program, namely, correction for investment, was quite successful, in spite of the tax rate during the war years. Under the correction for investment sales approach, capacitors are sold as a matter of a number of dollars invested to return a given amount. This approach limits itself to a very few customers because low load factor, power factor too far below 80% (discounts start at 80% and reach 7% at 100% power factor) and future operations and loads are too indefinite. To qualify for a discount the customer must also have a demand of 150 kw. or over and use more than $2 per kw. of demand. Because of cost of capacitors, it is well to consider only those customers served at 460 volts or over and those that have existing power factors above 65%; a good investment should show a pay-off period of less than three years, disregarding such intangibles as voltage regulation, line losses, etc.

The surplus tax imposed on business during the war years hampered this program to a large degree. Capacitors were considered as a capital investment and depreciated over a long period of time. Since all savings were reflected in increased earnings, the tax absorbed from 60% to 90% of the anticipated savings, so that the pay-off period became in most cases, not two, but ten years. Large plants could realize a 24- to 30-month pay-off on corrective equipment, but unfortunately 80% of all savings were taken through the surplus profits tax. In spite of this, many plants went ahead with recommendations with an eye to the future.

The procedure with such plants involves, first, an actual check of loads and power factor. A thorough study of the results is then made and final recommendations submitted in the form shown in Table II.

After capacitors are installed, it is usual to prepare a follow-up report in the form shown in Table III.

In preliminary talks with plant owners, it is safe to use a short-cut method of determining investment and probable return. This is illustrated in Table IV.

It is well to remember that in cases of installations for investment, the chief concern is the average power factor over a billing period. Actual checks made in plants invariably verified the calculations by the short-cut method. No hesitancy need be experienced in using the short-cut method only, as this represents the maximum correction that might have to be made.

The net result of this program exclusive of installations under 30 kva. has been:

Recommendations	45
Accepted	23
Installed capacitors	6,405 kva.
Savings on distribution feeders	$18,000
Savings on station equipment	$57,000

Total refund to these customers on power factor discount amounts to $9,000 per year at this time. A number of these installations were emergency installations as that discussed in connection with Table I and will not earn discounts until demands are reduced.

In Vernon there are approximately

Table III

Before Improvement:

Demand Kw.	Rkva.	Power Factor	Time
914	814	74.7%	11:30
893	869	71.7%	12:18
893	820	73.6%	12:32

Average power factor for month was 73.47%. Refund—0

After Corrections:

Demand peak 1,072 kw.—(added 150 hp. m-g arc welders at time of installing capacitors)

Demand Kw.	Power Factor	Time
980	83%	9:15 a. m.
915	82%	2:20 p. m.

Average Power Factor for 10 days—90.3%. Estimated refund $172 per month.

Table IV

Average Demand	900 kw.
Average Power Factor	73%
Corrected Power Factor	90%
*Conversion Factor	.452
Kva. of capacitance	.452 x 900—407
Approx. Investment	$3,000
Annual Refund	$2,000
Return on Investment	66 2/3%

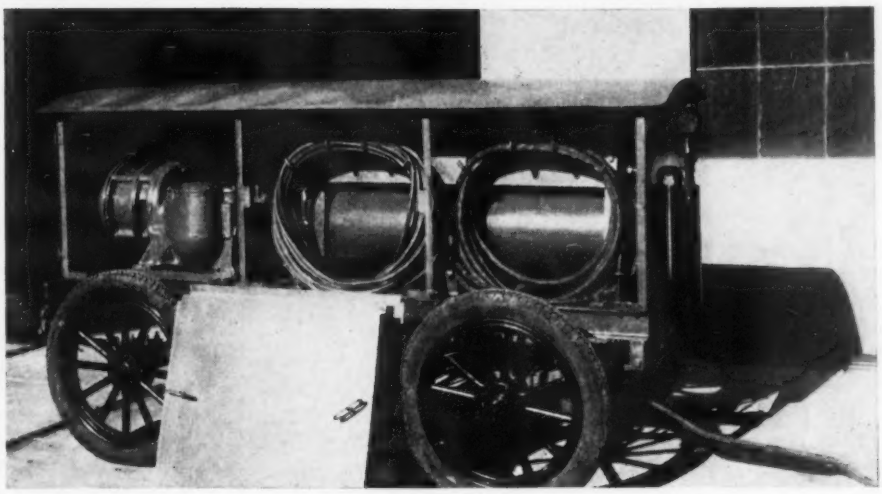
*Conversion factor obtained from power-factor correction tables found in handbooks or manufacturers' diaries.

20 customers who make it a practice to maintain a 90% power factor or better. Their billings are checked periodically and they are notified when they drop below 90%. If these customers were to operate without power factor correction, an additional $70,000 would have to be invested in substations and further amounts in feeders and generating equipment. Discounts earned by these customers total $70,000 per year.

At present there are nine new and expanding plants in Vernon, all of which have been given power-factor correction recommendations. Corrective kva. involved is approximately 1,500 kva.

The total installed capacitors in Vernon is approximately 12,000 kva. With the frequency change to 60 cycles, an automatic increase of 2,000-kva. correction will result.

Now that companies are getting back on a competitive basis and savings will be reflected in reduced cost of the product, studies of the other 22 plants formerly approached will be brought up to date. Continuous checks of load conditions in plants will be made so that, as rapidly as changed operations or loads make a customer eligible for refunds through improved power factor, contact can be established by means of the preliminary or short-cut report.



Compressing unit mounted on old Ford chassis for portability at substation

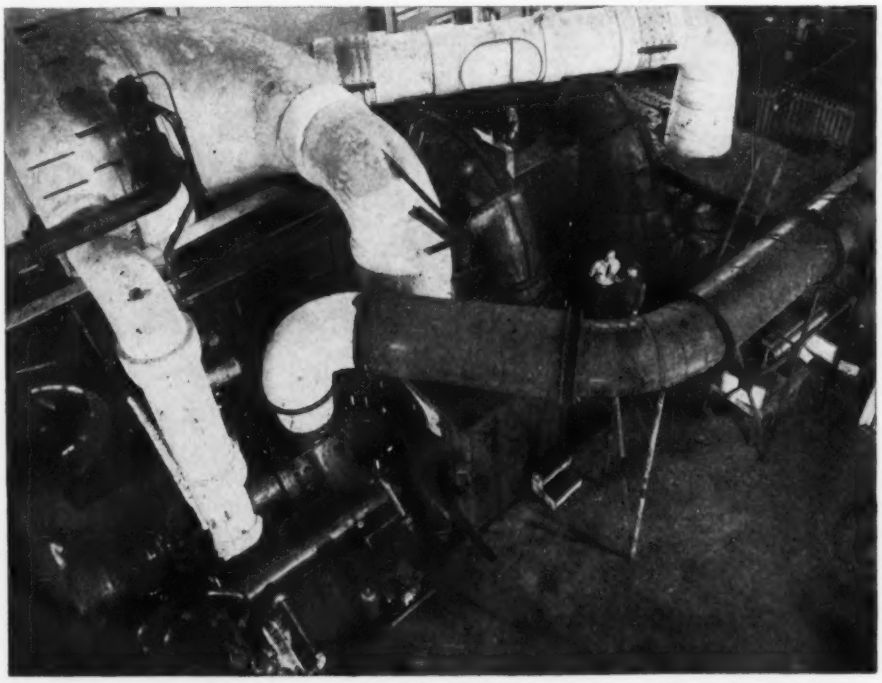
Mobile Compressor Eases Maintenance

WHEN Pacific Gas and Electric added condensers at its Newark substation, compressed air for cleaning was needed at some distance from existing compressed air facilities. Difficulties of getting equipment to augment or extend the existing facilities led to the improvisation of a mobile compressor which has proved to be cheaper and less troublesome than a fixed system.

The station compressing unit was dismantled and mounted on an old Ford chassis, together with necessary attachments, as shown in the illustration. Compressor capacity is 15.7 cu. ft. per min., in providing air at about 80 psi. The compressor is driven by a 220-volt, 3-phase motor. Air is furnished to a receiver, which happens to have a liquid rating of 53 gal., 130 p.s.i.

Work was done by construction department men at Newark, with some engineering supervision by D. B. Dexter.

Successful operation at 1,350° F. has been reported for this gas turbine installed at the Navy's experiment station at Annapolis by Allis-Chalmers. It is 1,350 hp., is intended for 1,500° operation as tests proceed. Fresh air is taken at the rate of 40,000 cu.ft. per min., compressed to 45 psi., preheated by exhaust gases, then passed through oil-fired combustion chambers. Whether this type gas turbine will develop central-station efficiency is problematical



AIEE Convention

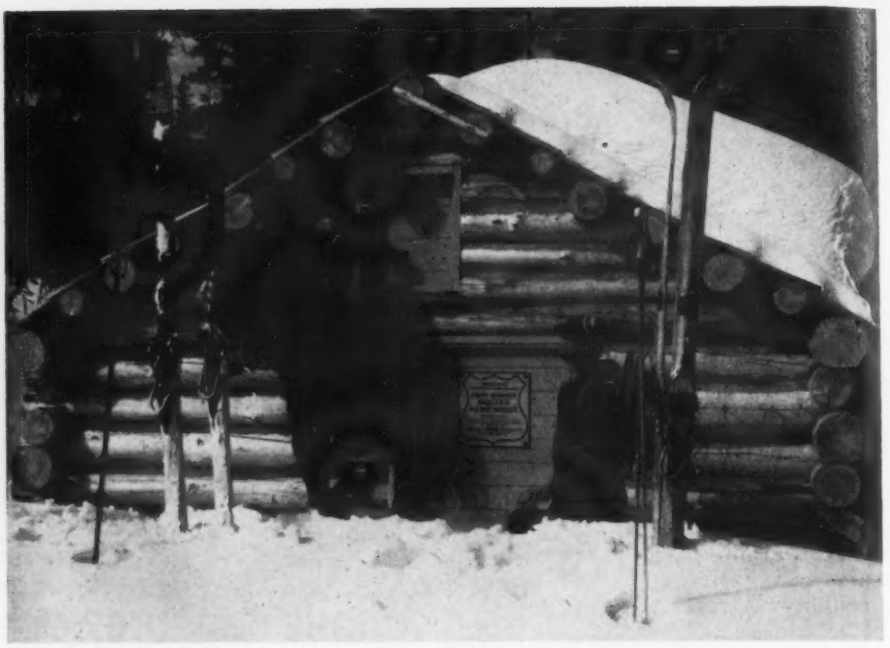
AIEE promises a full, rounded and firmly-packed program for its first postwar summer convention at Hotel Statler, Detroit, June 24-28. Technical sessions will be held two afternoons, as well as every morning, in order to cover the range of subjects on which papers are to be submitted.

Inspection trips are scheduled to an automobile factory, a tire factory and the Edison Institute Museum at Dearborn. Entertainment, in addition to special events arranged for the ladies, will include a twilight American league ball game, an evening smoker, golf.

Hotel reservations should be made early by contacting the AIEE summer convention hotels committee, 1005 Stroh Bldg. Detroit 26.

● STANDARD FOR AUTOMATIC STATION CONTROL, (etc.), published by American Standards Assn., 15 pages, 40c. Numbered C37.2-1945, this revises the 1937 standard and covers all automatic switching devices for controlling stations (remotely or otherwise).

This Year's Water — Snow Tells The Story



THE over-all 1946 water outlook, as announced by the snow-survey authorities, is for runoff generally equaling or exceeding the long-term average in the northern half of the Mountain and Pacific states and subnormal supplies in the southern drainage basins. In portions of the Columbia River Basin, runoff may be as much as 200% of normal, a potential flood menace being indicated along both sides of the Cascade Mountains and the lower reaches of Kootenai River. The decline from north to south is progressively emphatic, however, and New Mexico, southern Utah, Arizona, and southern California will experience shortages of severe proportions. The deficiencies will be somewhat eased by carry-over storage, which, with careful use, may be enough to meet 1946 requirements of most areas having storage rights. Storage in Arizona reservoirs, however, is far below total capacity and substantially below the long-term spring average.

Such is the general picture. While absolute accuracy is not expected from runoff forecasts based on the snow surveys, those made in recent years have been closely realized. An example is afforded by the 1945 forecasts for the Mountain States (see ELECTRICAL WEST, May 1945) where estimates for 15 major drainage basins indicated 99% of a ten-year average runoff; the measured runoff turned out to be 97%.

The following paragraphs summarize the prospects for 1946 runoff and storage, both as related to ten-year averages. The storage percentages represent major reservoirs for which ten-year averages are available, and are in terms of storage capacities. Authority for these forecasts is the Division of Irrigation, U. S. Soil Conservation Service.

Arizona

Runoff is expected to be low, ranging from about 40% on Gila River to about 50% on the Salt, Little Colorado and Verde rivers. Reservoir storage is very low, with eight important reservoirs showing about 55% of their long-term average storage and 21% of capacity. Storage in Lake Mead is 20,983,000 acre-ft.; capacity, 31,142,000 acre-ft.

California

The state-wide prospect is satisfactory, though better in the northern drainage basins than in the south. Snow pack tributary to the Sacramento is slightly above normal, but the excess is not enough to cause floods unless heavy rains should occur during the melting season. San Joaquin watershed snow pack is a little below average, but will supply enough water for normal needs with the possible exception of Kern River, where some economy may have to be exercised. It is doubtful whether snow water will reach Tulare Lake through Kern,

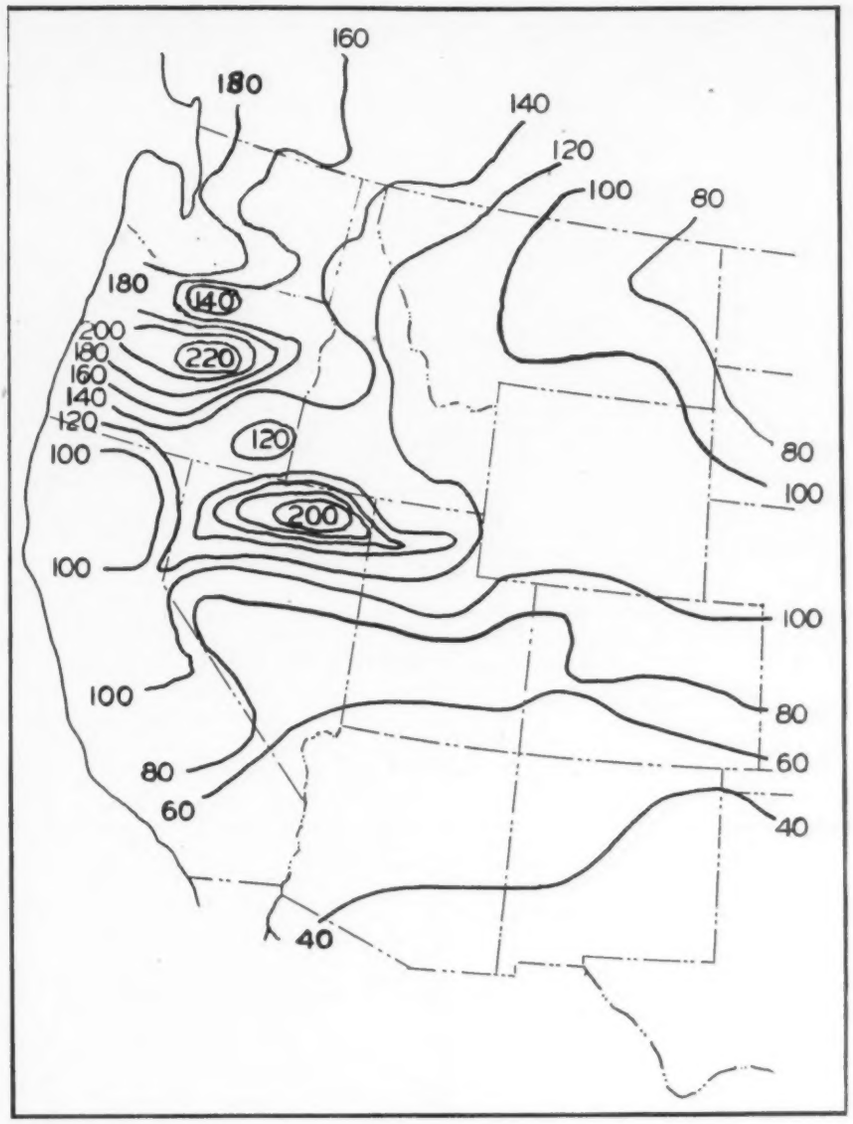
Some Facts About

FORECASTING the weather three or four months in advance, although attempted by almanac makers ancient and modern, still lacks dependability, but long-range forecasting of the stream flow that substitutes for rain on Western farms and turns the turbines of power plants is now done with precision.

The federal government, private industry, and individuals, under the pressure of necessity or expediency, have carried development and use of the natural resources of the West to the point where water has become the matter of greatest concern, since it is the initially limiting factor in most such development.

In most states, the water-supply forecasts are based on all snow-survey data available, whether assembled by the Soil Conservation Service or by other agencies. Through its Division of Irrigation, the Soil Conservation Service is officially charged with the responsibility of assembling snow-survey information, making forecasts and distributing the information to interested water users. Surveys are made as close to the first of each winter month as possible, and

Prospective stream flow April-Sept. 1946 in per cent of 10-year average



Kings or Kaweah drainage; if any, the amount will not be large. In reservoirs of the Sierra stored water is more than the long-term average. In 27 reservoirs having a capacity of 7,086,000 acre-ft., 5,271,000 acre-ft. is already in storage. With normal operation all reservoirs should fill before melting ends. As of April 1, storage in the 24 reservoirs was already 105% of the ten-year average.

Snow pack as of April 1, in per cent of normal, ranged as follows: Upper Sacramento — McCloud — Pit, 100; Feather, 95; Yuba, 115; American, 107; Mokelumne, 105; Stanislaus, 101; Tuolumne, 98; Merced, 97; Upper San Joaquin, 92; Kings, 88; Kaweah, 87; Kern, 80.

Colorado

Outlook is for more or less normal runoff in the northern part of the state, but less favorable in southern Colorado. Percentages of normal range as follows: Poudre, 100; South Platte, 90; Yampa, 100; White, 75; Upper Colorado, 85; Gunnison, 60; Dolores, 50; Animas, 50; Rio Grande, 50; Arkansas, 75; Purgatoire, 60. The ten-year average for April 1 storage, representing 48 reservoirs, is 32.3% of capacity, but the corresponding 1946 figure is 47.9%.

Idaho

In Snake River basin supplies are expected to be abundant but without much danger of flood. Moderately high water is looked for in the area drained by Boise, Payette, Weiser, Malheur, and Burnt rivers. Flow is expected to range, in per cent of long-time normal, as follows: Clearwater, 119; Salmon, 119; Snake, at Moran, Wyo., 104; at Heise, Ida., 100; at Weiser, Ida., 124; Big Lost, 101; Big Wood, 112; Boise, 139; Payette, 126; Weiser, 179; Kootenai, 134; Spokane, 145. Ten major reservoirs show 75% of capacity against 68% as average for April 1.

Montana

Runoff in prospect both east and west of Continental Divide average close to normal, as follows: Milk, 85; Marias, 100; Missouri, 100; Musselshell, 90; Jefferson, 110; Madison, 110; Gallatin, 100; Yellowstone, 110; Tongue, 110; Clark Fork (of Columbia), 107. Twenty-four reservoirs which normally are 47.9% full at this season, show 59.3%.

Nevada

Prospective runoff varies in per cent of normal, as follows: Upper Humboldt, 200; Lower Humboldt,

Water Forecasting

within a few days the latest information on the snow cover is in the hands of the waiting water users. The first report is issued for Jan. 1 snow conditions, and the last for May 1, that normally being the latest date when the maximum accumulation of snow may be measured. In ordinary seasons little change is reflected by the May report over that of April.

The Division of Irrigation devotes much attention to the hard, dangerous work required of the snow surveyor. This part of the job has required the services of men who know how to make their way far into the mountains on foot during the winter and who may be depended upon to make the snow surveys conscientiously under trying circumstances. It has been necessary to have available more than a thousand of these men in order that the surveys may be made simultaneously throughout the West. So far, this manpower has been supplied largely by many different organizations, such as the Forest Service and irrigation companies with experienced men available who can be depended upon to see this task successfully completed.

160; Eastern Nevada streams, 70; southeastern Nevada, 60; Truckee, 100; Walker, 70; Carson, 70. Storage in six major reservoirs is 82% of capacity, as against a corresponding normal of 51%.

New Mexico

Runoff is expected to be substantially below normal, as follows: San Juan, 50; Chama, 50; Canadian, 40; Pecos, 40. Five major reservoirs show 46.4% of capacity, as against a normal of 45.3%.

Oregon

Stream flow for the April-September period will furnish from good to abundant supplies, prospective average being 143% of normal with a range from 115 to 238%. Twenty-two reservoirs with total capacity of 2,656,090 acre-ft. are 72% full as against a usual filling on April 1 of 71%.

Utah

Storage of water in snow varies widely. In the northern part of the state it is considerably above normal, but southern and eastern sections are deficient. Supplies will vary from 148% of long-term average on Blacksmith Fork River to 55% on Sevier. Hold-over storage is at a high point and storage rights will experience no shortage. All reservoirs will fill except Utah Lake, Bear Lake, and Strawberry. Utah and Bear are higher than at any other time in the past ten years, and all three will have available more than enough water to meet irrigation demands.

Washington

Unusually high river stages can be expected throughout Columbia Basin. Potential flood hazard exists in some areas along both east and west slopes of the Cascades and along the lower reaches of Kootenai River. Estimated flows: Columbia, at the Dalles, 116% of normal; Chelan, at Stehekin, 124; at Lucerne, 143; Okanogan, 137; Methow, 140; Wenatchee, 137; Yakima, 183. Reservoirs with capacities totaling 1,082,000 acre-ft. are 57% full as against a normal of 65%.

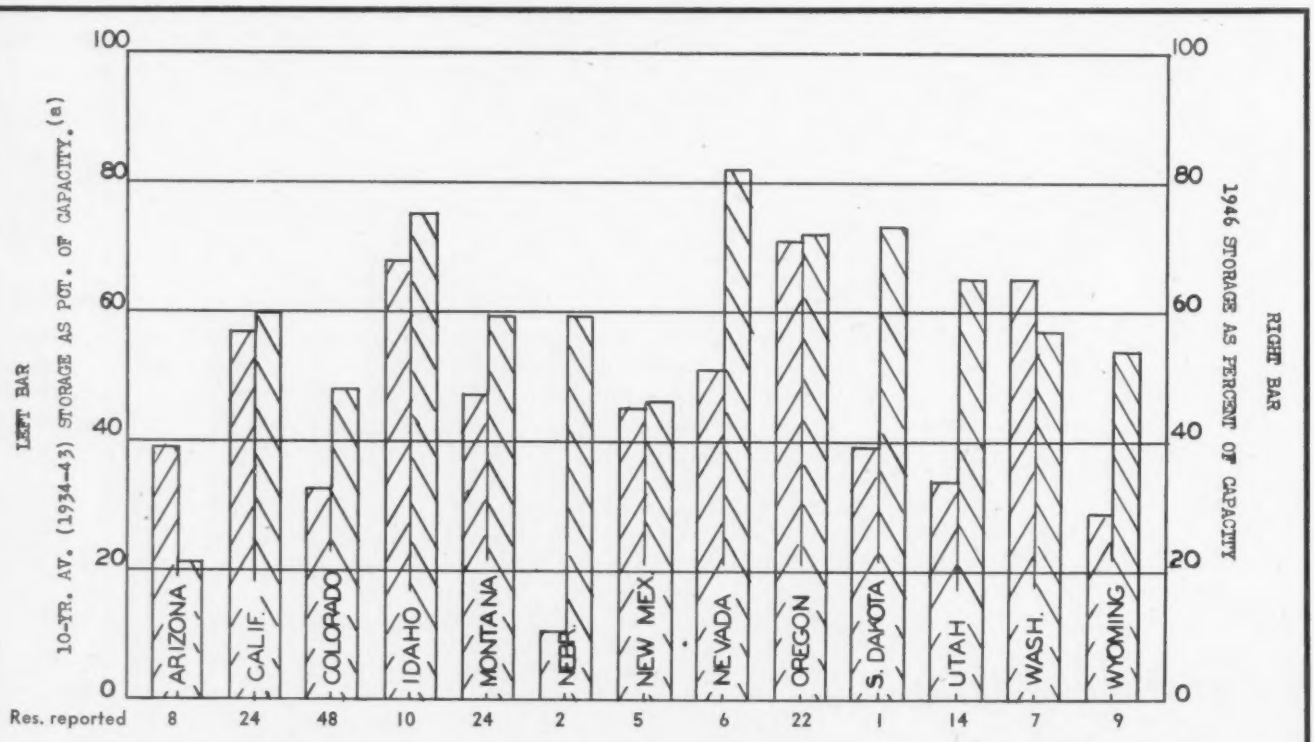
Wyoming

All principal streams are expected to carry more than normal runoff, as follows: Shoshone, 105; Greybull, 110; Bighorn, 110; Powder, 110; Green, 115; Sweetwater, 110; North Platte, 100; Laramie, 100. Belle Fourche River will carry only 80%, but Belle Fourche reservoir (in South Dakota) is 73% full as against a long-term normal of 39.2%. Nine Wyoming reservoirs, normally 29.1% full, now show 54.3%.

British Columbia

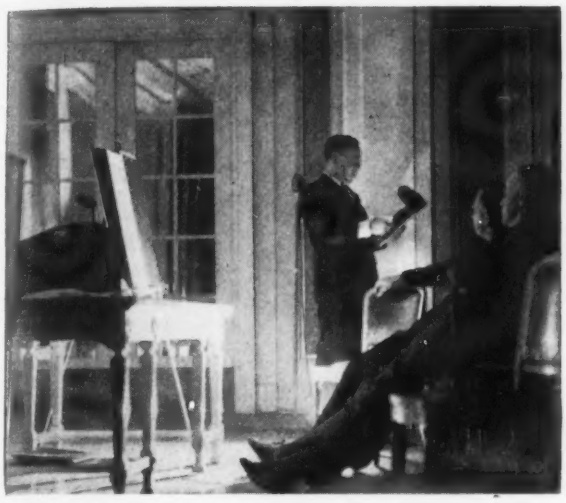
Through the cooperation of the Department of Lands, Province of British Columbia, the Soil Conservation Service is able to report the following prospects for Columbia Basin in British Columbia:

Runoff will be substantially above normal in percentages as follows: Kootenai at Wardner, 138, at Columbia confluence 149; Elk, 149; Columbia at Trail, 161; Okanogan, 166. Storage reservoirs are full or nearly so. Soil is moist and not frozen below the snow.



RESERVOIR STORAGE AS OF APRIL 1, 1946.*

* Not all reservoirs in all states are reported, but enough are reported to provide a reliable index of each state's storage supply. (a) Most state averages for reported reservoirs are for full 10-year period but in a few cases reservoirs having less than 10-year records are included. (b) Does not include Narrows (Yuba River) Friant or Shasta reservoirs. April 1 1946 storage in these three reservoirs combined is 3,536,000 acre-feet, which is 84 percent of their capacity. (c) Does not include Fort Peck reservoir (capacity 19,000,000 acre-feet); April 1, 1946 storage 12,890,000 acre-feet. (d) Does not include Lake Mead (capacity 31,140,000 acre-feet); April 1, 1946 storage 20,983,000 acre-feet.



J. F. McAllister

Lighting Men Get Review-Refresher At Salt Lake Conference

MORE to outline a pattern which others may follow with equal success than to report in any adequate detail what was said and done, the lighting conference of the Intermountain Electrical Assn., is sketched and summarized in the following. It was staged jointly with, and a day ahead of the annual meeting of the Utah Chapter, International Association of Electrical Inspectors, at the Newhouse Hotel, Salt Lake City, April 8.

Attendance came from contractors, engineers, equipment representatives, wholesalers, utility lighting personnel, electrical inspectors and architects. It was well attended. Some 150 registered. The meeting proved interesting and fruitful and it was felt by its sponsors, the lighting committee of the IEA, headed by A. E. Fleming, that it gave lighting people a real review and refresher course before they launch into the new era just opening.

By careful organization of the program, display and illustrative materials available from various manufacturers, speakers and their topics, a full sweep of the subject could be condensed into a one-day meeting. Then to give each participant a reference file of information gathered at the meeting to take home and use, copies of each talk were mimeographed and bound and presented to each one who registered. A fee of $1.50 was charged to cover this and other conference expense.

The lighting committee, which had charge of the program and arrangements, consisted of A. E. Fleming, General Electric Supply Corp., chairman; P. A. Maughan, Westinghouse Electric Supply Co., vice-chairman; Charles Wardrop, vice-chairman, and Raymond Ackerman, Ernest L. Dee, L. B. Gawan, D. H. Hutchinson, Elmer Jonsson, and Homer Shaw.

Program of the conference followed a definite prescribed pattern. It began with a *History of Light* which likewise discussed the incandescent type of lamp. Following was a section on fluorescent and other discharge lamps, a talk on operation and service problems, chiefly of discharge lamps, and one on lighting maintenance.

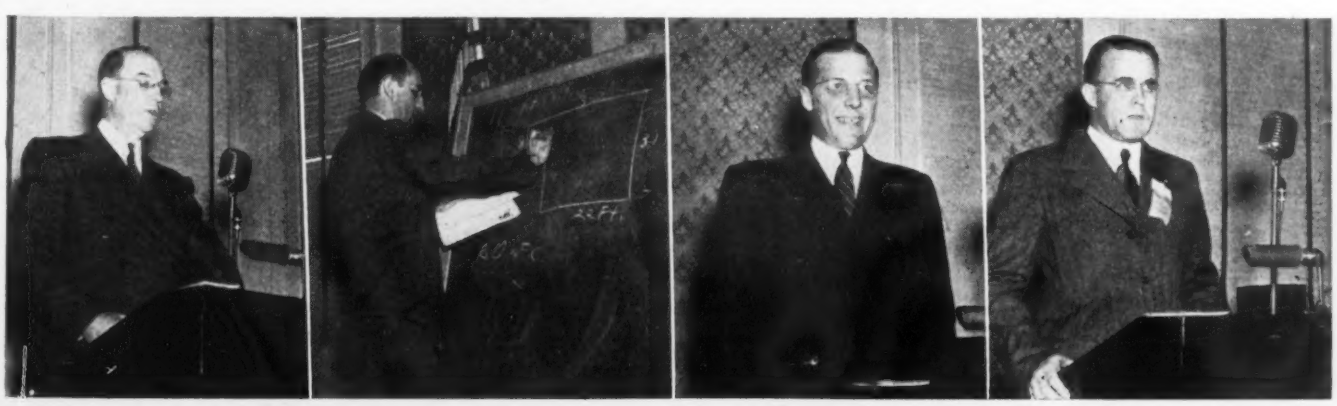
Getting deeper into the subject, there followed a talk on general luminaire design and an explanation of the general service, single meter rate of the Utah Power & Light Co.

Then came a group of subjects bearing on the fundamentals of illumination and general lighting design with specific solutions for a store lighting problem, an office lighting problem, a school classroom lighting problem, and an industrial lighting problem. Then followed a discourse on the effect of fluorescent lighting on eyesight. Residential lighting next had its innings, and the meeting concluded with a discussion of the responsibility of selling proper and well-engineered lighting.

The history of light, as covered by E. L. Dee of General Electric Co. lamp department, sketched the history of illuminants and the construction of the tungsten filament lamp. It then covered various data concerning incandescent lamps, their advantages and disadvantages in light control, and ended with the introduction of several recently developed incandescent lamps such as sealed beam headlights, heat lamps, sun lamps, etc.

Fluorescent and other discharge lamps, covered by Elmer Jonsson, Westinghouse Lamp Division, explained the characteristics, the new uses and applications, the limitations of fluorescent lamps, and then dis-

Slusser Sharp Fleming Littlefield



cussed briefly mercury vapor, sodium vapor and germicidal lamps.

Operation and service problems were covered by L. B. Johnson, General Electric Co. After describing the basic circuits used in operation of discharge lamps, Johnson covered some of the difficulties sometimes encountered, such as humming of the ballasts, overheating, flickering, etc. He made the distinction between pre-heat and high-voltage types rather than hot or cold cathodes. He also explained the operation of starters and of the no-blink starter and ended with an admonition to check the wiring and the voltage to see that both are adequate to serve the installation.

Lighting maintenance was emphasized by Leonard Slusser, associate and partner with Raymond Ackerman, consulting engineers. He indicated how much loss in illumination resulted from dirty luminaries, lamp outages, and improper voltage. Likewise he suggested maintenance schedule for periodic cleaning, as well as periodic light meter checks.

General luminaire design was covered by A. E. Fleming, General Electric Supply Corp. He differentiated between the possibilities for light control with filament lamps, where the light source is relatively small, and the fluorescent lamps of tubular character. From this point on, he demonstrated lenses and diffusing glasses and reflector contours and their effect upon distribution of light. The special applications in which fluorescent lamps are best adapted were covered to conclude the talk.

The general service single meter rate of Utah Power & Light Co. was then explained by J. H. Shaw, manager of commercial sales. Its details and application to lighting were discussed in some detail with charts showing cost for various steps of the rate. This was followed by an analysis by zones of customer use. Out of this, Shaw pointed out the possibilities for selling more illumination to the 67% of the customers who use 500 kwh. or less. He likewise showed how customers benefit by the new schedules and suggested that they could be sold improved lighting installations at very little increase in operating cost.

Vacher Halliday Shaw

Fundamentals of illumination and general lighting design were then sketched by J. C. Littlefield, supervisor, commercial and industrial sales, Salt Lake division, Utah Power & Light. He pointed out first why a planned lighting job was necessary and then, by using some of the educational sound-slide films of Westinghouse, covered quickly illumination terms and units of measurement, as well as principles and methods of light control. Folder D, put out by General Electric Co. Lamp Department, was likewise explained, preliminary to its later use in designing interior lighting installations. It covered spacing of luminaires, factors influencing size of lamps, room index, types of systems, utilization factors and calculations to determine the number of units required.

Beginning then a series of *specific lighting problems*, Dan H. Hutchinson, Graybar Electric Co., using the data from Folder D, sketched the method by which a lighting job would be laid out for a *small store*. Making use of the 1-3-5-10 formula of approximate desirable ratios of light intensity for various areas, he indicated how these could be obtained in the typical job.

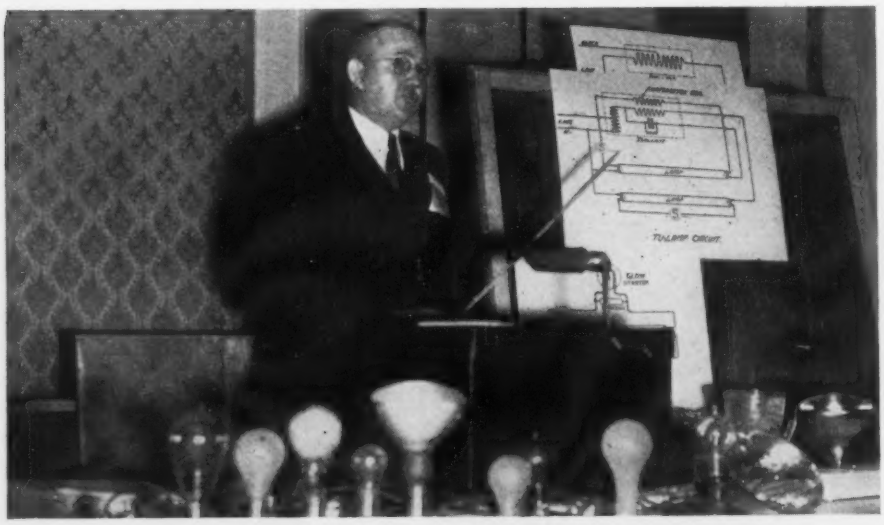
J. Vernon Sharp, electrical contractor, did a similar job on a specific *office lighting problem*. In addition to sketching a typical office situation and laying out the lighting for it, he suggested the psychology of presenting it to the customer. He urged that the customer be made to participate in the design, that he be given a personalized bid form or proposal, and ended by suggesting that customers be advised to operate fluorescent lighting installations with less interruption to get longer lamp life, etc.

C. J. Vacher, General Electric Supply Corp., did a similar job on laying out an adequate *classroom lighting installation* after discussing the importance of illumination to the school child. He covered the subject of distribution, glare, brightness ratios and then planned a lighting layout with fluorescent units for a typical classroom, either with the hoppers running at right angles to the room or vertically between rows of desks.

P. A. Maughan, branch apparatus and supply manager, Westinghouse Electric Supply Co., handled an industrial lighting installation in a similar fashion and indicated the levels of illumination required for various types of tasks.

To answer the often-asked question as to the *effect of fluorescent lighting on eyesight*, A. LeRoy Taylor, dean, School of Mines and Engineering of the University of Utah, presented a sensible analysis of the entire subject. He covered flicker, radiant energy outside the visible range, and similar complaints. By presenting data as to intensity of ultraviolet energy shorter than 3,150 a.u. and comparing the radiant energy from various illuminants, he dispelled all cause for complaint on that score. He then quoted letters between a representative of the Smaller War Plants Corp. of Seattle and the American Medical Assn., on the subject which had been reprinted

Lester Johnson



in the Journal of the American Medical Association, Vol. 124, page 608, Feb. 26, 1944. His conclusion was that unsatisfactory installations, where brightness was not properly balanced, could be the real cause of complaint and not the illuminant itself.

Residential lighting was covered by J. F. McAllister, manager of residential sales, Utah Power & Light, who, after preliminary remarks, presented the illustrated talk on residential lighting prepared by the Home Lighting Institute at Nela Park, Cleveland.

The selling of lighting was presented by Vere C. Halliday, sales training director of Utah Power & Light Co. He contended that there is a need for adequate sales training in order to present lighting to the customers. Making use of one of the Edison Electric Institute-National Electrical Wholesalers Assn. training films, he pointed out the fundamentals of selling which need to be considered in making a presentation of lighting recommendations.

By scheduling a rehearsal of each of the talks the timing was worked out accurately. Those in attendance received not only a review of lighting fundamentals and practices, but considerable new working data from which to plan installations. Likewise they were told where other information could be obtained. As a preliminary to an active lighting era when materials and manpower are available again for installation, this course proved timely and valuable.

Street Lighting Code

Fruit of four years' further research on night traffic accidents and illumination is the new IES street lighting code, just off the press, superseding the 1940 version. This gives up-to-date information on the lamp size and luminaire needed to furnish the recommended intensity of light, together with appropriate mounting height and spacing for various widths of thoroughfare and reflectivities of pavement. The importance of the code in promoting traffic safety was well demonstrated by the 1940 edition. This was used in planning installations of safety lighting in Detroit, Hartford, Salt Lake City and Los Angeles with resulting decreases of as much as 90% in night traffic accidents.

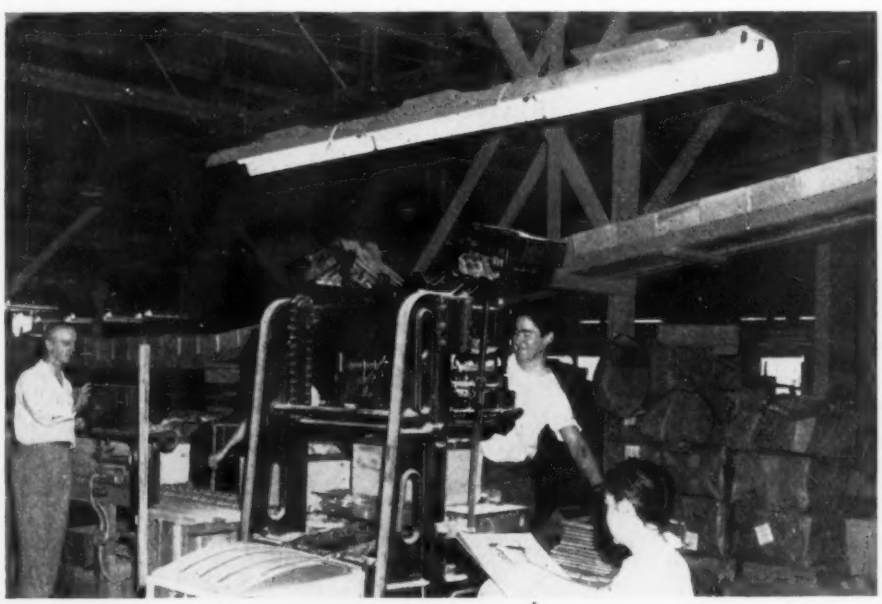
● MODERNIZATION of street lights throughout San Bernardino, Calif. has been authorized, according to City Electrician Jess K. Ross. Extending through the next few years, the program will include replacement of standards to raise lamp centers by 10 ft. and double light output per unit.

Light Joins the Food Program

CONTRIBUTING to the conservation of food at numerous packing plants throughout the West are various lighting installations developed under the impetus of individual salesmanship in a period when the world's current difficulties could scarcely have been foreseen. Tomatoes, peaches, pears, plums and countless other items will find their ways to strange markets this season because of good lighting. For lighting in packing plants not only makes the work easier and quicker but also protects the good fruit by making it possible to identify the bad.

Charles Werner, then manager of the Newcastle Fruit Growers' Assn. plant, is credited with having made the first real attempt at lighting sorting tables —that was back around 1930. By trial and error, many tricks were learned quickly, and as installations spread to other plants, more data were accumulated on the particular benefits of lighting in the handling of various crops.

Both intensity and color composition play important parts. In sorting pears, for example, increasing the light intensity makes identification of pinhole worm defects more certain, while high violet content accents bruise marks and sunburn. Fluorescent units and accumulation of data have vastly increased the lighting man's facility in handling color correction and led to new applications, like those illustrated herewith.



A. B. Smedley, electrical engineer with the Technical Products Co., Pasadena, Calif., has become well known as a sponsor of adequate wiring, particularly through his talks for the PCEA and for the Home Planning Institute. He has done a great deal of work lately in developing and fostering the low-voltage control principle for application to homes and has contributed the preliminary suggestions for low-voltage control specifications which are a part of the article on this page. Another application of low-voltage control, by other sponsors, was described in April 1946

CONVENIENCE in the control of home lighting, convenience to a degree heretofore outside the range of most family budgets, now appears feasible through the medium of low-voltage control. This means of controlling the main power circuits may now be applied in the home, just as it has become the standard means of controlling power in the industrial plant. Relay developments make this practicable, and the scheme offers the prospect of moderate-priced homes equipped with push-button light controls at every doorway, with master controls in key rooms and, if desired, with push buttons to control an almost endless variety of both new and routine household conveniences.

Convenience on such a scale might well be implicit in the term, adequate wiring. For adequate wiring is not a fixed or specific thing, but an expression of how to realize an indefinite amount of convenience. That this amount of convenience is not fixed can easily be proved by comparing adequate wiring standards as set forth over a period of years, and noting the constant trend toward emphasis on convenience in addition to mere specification of wire size.

Low-voltage control makes it possible, without the almost prohibitive expense usually associated with standard 110-volt a-c control, to provide light control points wherever convenient throughout the house. In such a house one may walk from room to room, turning lights on and off by simply pushing the nearest button, thus establishing a path of light for himself without ever walking out of his way or stumbling in the dark.

Low-voltage control, while requiring a push button for each control station

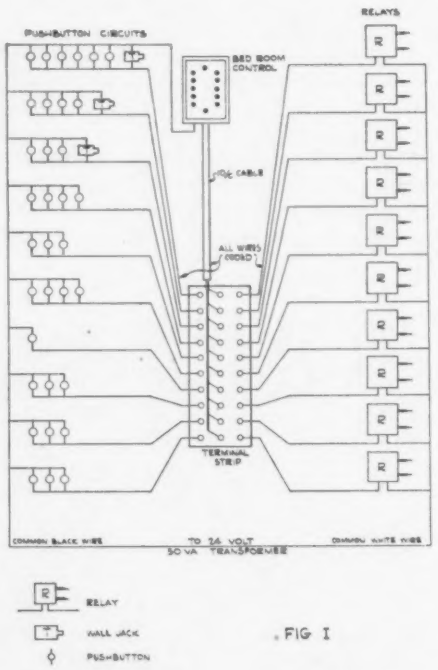


Fig. 1—A simple control system employing step type relays, terminal strip for servicing and master bedroom control. Phone plugs fit into jacks to extend push-button control as desired

and a relay for each unit being controlled, together with associated wiring, gains its economy through the elimination of 110-volt conductor and conduit runs to the control points. By using, for example, a 24-volt control system, No. 22 wires can be utilized, for the control circuit. Switch loops, which even in an average house may account for one-third of the wire, are eliminated together with their conduit —and also together with switch-loop voltage drop.

How a low-voltage control system might be applied is indicated in the accompanying drawings. Fig. 1 shows the wiring for ten units, controlled from a variety of stations and from a master station. Fig. 2 shows how such a system might be worked into an average-sized home.

This is the way a home might look, utilizing the push-button controls which have been common in vital industrial work for years. Rapid development of small controls during the war quickly led to the use of relays for controlling carburetors, propellors, guns, bombs, landing gear and oxygen in aircraft. These tried-and-proved relays may now be adapted with ease for the improvement of convenience associated with adequate wiring.

As systems of this sort become better known to the public, push-button wiring may come to represent adequate wiring to the layman. For this reason it appears timely to consider some preliminary standards. Following are suggested specifications prepared by A. B. Smedley, a sponsor of adequate wiring, and an energetic proponent of low-voltage control.

General

The control system shall be operated at 24 volts or less and shall be supplied with power from a 50-va. (or less) transformer. One or more terminal strips shall be installed. All control circuits and all relay circuits shall terminate at these terminal strips. The terminal strips shall be provided with two sets of studs, one set for control circuits and one set for relay circuits. Removal of jumper provides means of checking both controls and relays. The component parts and materials shall be of a quality described in the specification and shall be installed in the manner prescribed.

Relays

The relays shall be for operation at 24 volts or less a-c when supplied by a transformer of 50 va. or less through a control circuit of No. 22 wire, 200 ft. in length. The relay contacts shall be S. P. S. T. for 120 volt, 10 amp. The relay may be either the stepping type (2-wire control) or the latching type (3-wire control). The operating coils shall be energized only during time interval when a push-button control is depressed. The relays shall be approved by the Underwriters' Laboratories.

Installation: The relays may be installed in the circuit outlet boxes or any other suitable location, provided that location does not increase the length of the wiring circuit controlled. Control wiring and power wiring must be separated at the relay locations in accordance with the National Electric Code.

Push Buttons

The push button shall be of suitable design for convenience of operation and reliability of service. The push button may be individually mounted, or, where two or more are required at one location, may be gang mounted on a plate of suitable design.

Installation: Stepping relays require only one push button for turning the circuit on or off. Latching relays require two buttons at any given location, one for turning on and one for turning off. Push buttons should be installed in the doorways wherever possible, and in every case installed in the most convenient location for controlling the lights operated by it.

Wall Jacks

Wall jacks shall be of telephone or radio quality and shall be mounted on suitable flush plates. The jacks shall fit the standard radio phone plug which will be used together with flexible braided cord of suitable length to extend push-button control to any convenient point within the room.

Installation: Wall jacks may be installed at as many locations as convenience of control requires. In general, the locations will be similar to the locations of the regular convenience outlet.

Terminal Strips

Low-voltage telephone type terminal strips having a double row of studs shall be used to terminate all control circuits and all relay circuits. The terminal strip shall have not less than four spare positions in addition to the number of positions required for controlled circuits initially installed.

Installation: Terminal strips shall be installed in a manner required by the National Electric Code. The location shall be such that it is centrally placed with respect to the control wiring and at a point convenient to the installation of control cable to master bedroom control. Cupboards, closets or service areas are suggested locations.

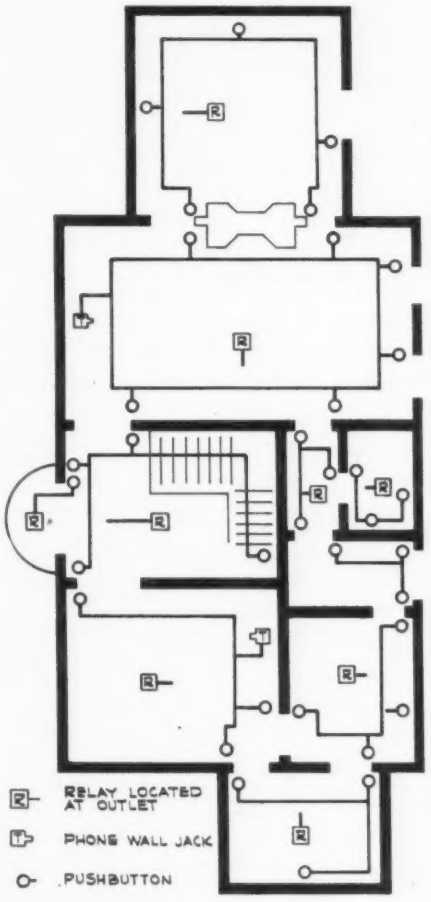


Fig. 2—First-floor plan of house with push-button controls which make it possible to provide path of light from every door and from other convenient points in each room. Wiring shown would all be part of the main load-carrying circuits. Reduction in length of load-carrying wire (by about one-third) would help pay for the control and for better adequacy in the remaining "working" circuits of house

Wire and Cable

The wires and cables shall be of a quality equivalent to low-voltage telephone or aircraft wire and cable. Cotton wrapped paraffined doorbell wire shall not be used. Each individual wire and each wire in cable to master control (when cable is used) shall be individually identified by color code or other suitable means. A common white wire shall run from the supply transformer to all relays. A common black wire shall run from the supply transformer to all control buttons and jacks. The cable or group of wires from the terminal strip to the master control shall contain one black common wire in addition to a coded wire for each button on the master control.

Master Control

The master control shall consist of a suitable flush wall plate and outlet box. The control plate shall have a readily identified button for each controlled circuit, and in addition shall have two spare buttons.

Installation: The master control can be located at any desired position, preferably in the master bedroom. Additional master or partial master control stations may be installed.

By such means, it is possible to realize the ultimate in convenience at the same or less cost than it is possible to get partial convenience through conventional house-wiring methods. Thus it is that the postwar concept of wiring adequacy may specify a home which exemplifies the push-button age.

● WITH many manufacturers and jobbers giving notice to contractors that quoted prices for materials will not necessarily be in effect at the time of delivery, San Francisco Electrical Contractors Assn. has advised its membership that esculator clauses may be advisable in bidding on private work. They suggest a statement to the effect that quoted prices are based on prevailing quotations, prices and wages and are, therefore, subject to change without notice, all material prices being in compliance with OPA provisions. An attempt to anticipate changes is the only recourse in government contracts, where esculator clauses are not acceptable.

● VICTORIA, B. C., will launch a $100,000, five-year street lighting program as soon as materials become available.

Promising Results with Radiant Baseboard

Portland trial installation developed by W. A. Ellis yields preliminary indications of economy, attractiveness and good performance in average home

ELECTRIC heating, utilizing wall baseboards for radiant panels, has been developed by W. A. Ellis of Portland. A trial installation in his home, 1909 N. Bryant St., has, during the few months it has been in service, showed a promising record of performance as to connected load, power consumption, heat distribution and temperature control. The system operates at low temperature, depending on large radiation areas to compensate for low power densities of 35 to 45 watts per lineal foot.

The baseboards are made of heavy sheet aluminum, a metal which lends itself well to this application because of its susceptibility to forming, rapid heat transmission qualities, resistance to corrosion, and ability to take paint. These aluminum baseboards are very finely corrugated to increase the radiating surface. The corrugations are so fine as to be scarcely perceptible at normal distances, with the result that when painted the baseboards look like any other baseboard except for an interesting surface texture, arising from the corrugations (Fig. 1).

The heaters are in contact with the back of the baseboard, as shown in Fig. 2, and are served in parallel by asbestos covered wires running within the baseboard itself. Each room is wired as a separate unit and fused. Switches may of course be provided. Proximity of the baseboards in one room to those in another makes wiring simple.

Heater units proper are 3 in. wide, 11 in. long and ¼ in. thick, wound with resistance wire embedded in ceramic. The design permits replacement of units in a matter of minutes with no tools other than a screwdriver and pair of pliers.

Each heater is backed with asbestos carrying an aluminum-foil reflector cemented to one side. Purpose of the reflector is to return in the direction of the room, heat which normally would pass in the opposite direction. The baseboard itself is backed with ⅛-in. asbestos sheet, thereby doubly enclosing the heating unit.

Bellows type thermostats are used for control, which is effected through a Minneapolis-Honeywell modutrol motor to a variable autotransformer (Fig. 3).

To test the in-place performance of the baseboards with regard to maximum temperature, various articles of furniture were placed in direct contact for long periods of time. There were no ill effects. This pragmatic method was followed up with a series of closely controlled measurements.

Throughout February of this year, action of the heating system was followed with an Esterline instrument for recording wattage, and a Brown Minneapolis-Honeywell electronic thermal instrument recording the temperatures.

The house in which this system is installed has a cubic content of 10,600 ft. Installed capacity is 6 kw. and the average demand is running less than 5 kw., or an over-all average of less than 0.5 watts per cu. ft. The house is of ordinary construction with simple wall and ceiling insulation, no weather stripping, and single-pane windows. Floors are also conventional, consisting of sub-floor, craft paper and hardwood. The house has a full basement, which was not heated during the test period.

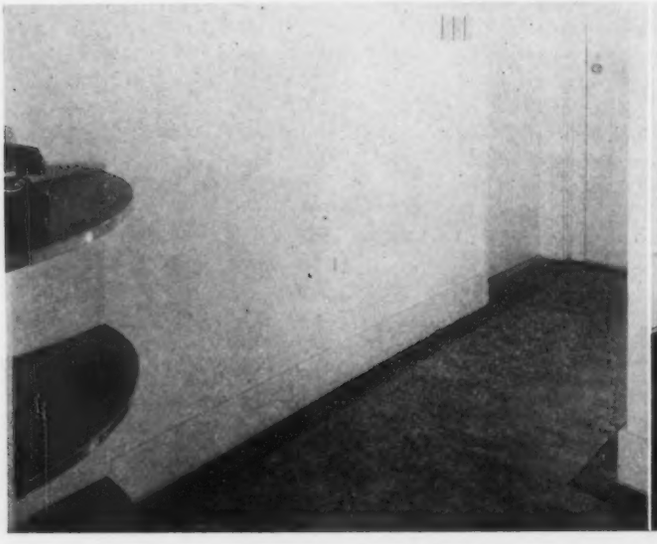
The recorded tests were made with thermocouples attached to the baseboard surfaces in two different rooms, three thermocouples measuring temperatures within the rooms, and another measuring temperature outdoors. Room temperatures were measured 1 in. below the ceiling center, 1 in. above the floor center, and at the thermostat, which was on one wall at mid-level.

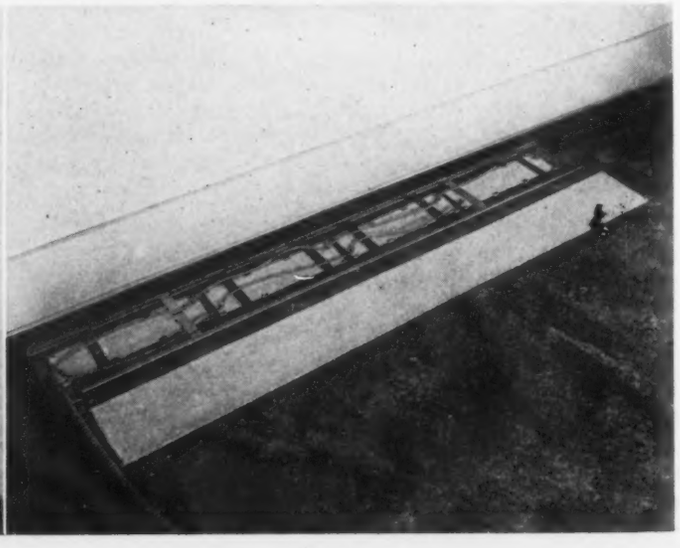
In the 24-hour period beginning noon Feb. 12, 1946, for example, outside temperature was fairly stable around 42° and 43° during the day, and was down to 35° in the night. Room temperature at the thermostat held at the preset temperatures to a dgree which for all practical purposes was exact. The preset temperatures were 72° for the day and 67° for the night.

In general, the floor temperature ran

Fig. 1—Radiant baseboard is attractive. Slight protrusion is unobjectionable; fine corrugations enhance appearance

Fig. 2—Back of baseboard has heaters in contact. Double asbestos heat shields are provided; replacement is simple





about 3° under the thermostat and the ceiling temperature about 1° above. In periods immediately following the opening and closing of doors, the floor to ceiling spread sometimes rose briefly to 7°.

Panel temperatures of course fluctuated considerably. These measurements were taken before installation of baseboards with the corrugated surfaces, and it is expected that subsequent readings will reveal lower baseboard temperatures. Maximum temperature in the room where 45 watts per ft. was installed was 200°; maximum in the room utilizing 35 watts per ft. was 147°.

The system appears to have the advantages of maintaining better humidity because of the absence of high-temperature units in the rooms and of eliminating dust troubles by not setting up rapidly moving air currents.

Data are not yet considered complete enough to justify conclusions as to over-all efficiency and operating costs, but preliminary tests appear most promising.

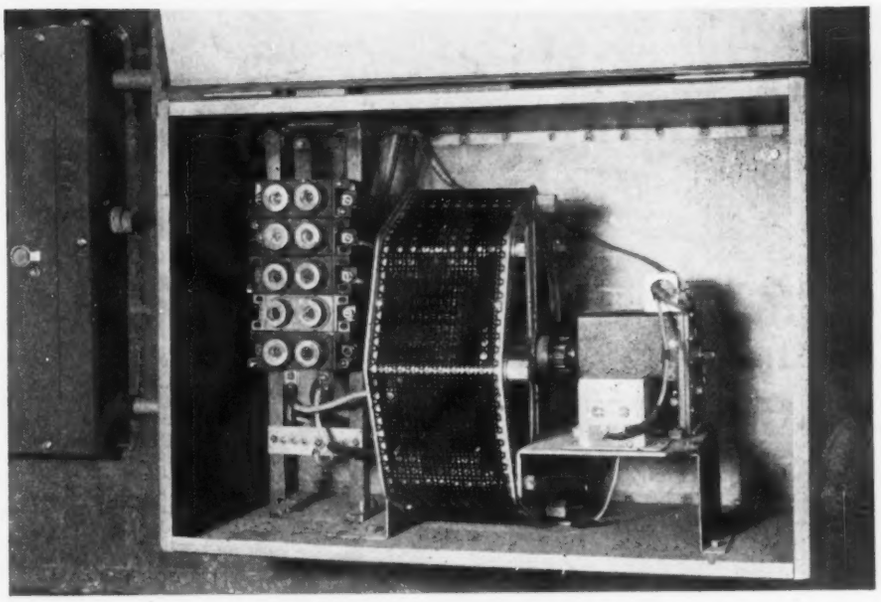


Fig. 3—Variable autotransformer is the heart of Ellis' control. It provides continuous load variation, tending to reduce demand, and holds temperature even

Keeping Lights Bright

Foot-candles will be four times as great as they otherwise would be in two years or so if lighting installations are properly maintained. Or, to put it the other way, most of the potential foot-candles in an installation will soon be lost if the thing is allowed to go to seed. Those are *average* figures, discovered by Wakefield Brass Co. in careful study of lighting at eight locations around Birmingham.

Out of these findings Wakefield Brass has built up an interesting case for the little-thought-of process of lighting maintenance. F. I. Wilson of the company told the story in an article in *American Business*, and reprints are being made available by the company. *Do You Get the Light You Pay For?* is the title of the Wilson article, and it well describes the basic idea in which Wakefield ties together adroit promotion and a real service to the user.

Average findings in the Birmingham tests were as follows. Installations as found yielded 26% of maximum foot-candles. After cleaning of walls and ceilings of the rooms they yielded 35%. After cleaning fixtures the yield was 43%. New lamps jumped it to 77%, and the final improvement was achieved by voltage correction.

● RESUMPTION of Denver's highway lighting program, interrupted by war, will go hand-in-hand with the municipality's traffic safety crusade. In addition to traffic lights, the city plans to install mercury vapor lights.

Photography for art's sake, or vice versa, throws dramatic shadows around this Maynard L. Parker photo. The shadows are absent, however, when the lights are on. Scene is the new Los Angeles ticket office of Western Air Lines. Light fixtures were designed by Wagner-Woodruff Co., Los Angeles, H. Roy Kelley was the architect, and Golden State Electric Co. made the installation. Cold cathode units are used in a trougher running the perimeter of the office, and again in the trough suspended over the counter. The same troughs are used to carry the directional-lensed units which provide high-level illumination on working planes

Sales Institutes Refresh L. A. Dealers

Prepare for the day when appliances will have to be sold again by taking review course under the industry's leading sales executives

LOS ANGELES electric appliance dealers are taking up the slack between war's end and resumption of civilian production by preparing for the future buyers' market.

Anticipating the renewal of competitive selling that must follow an initial buying wave, the Los Angeles Department of Water and Power has begun a sales training course designed for electric dealers and salesmen. This program, conducted at the utility's "Matchless Electric Home," provides comprehensive instruction in the most modern selling techniques and the domestic appliances that will so materially aid Mrs. America in escaping the drudgery of the inadequately equipped home.

Not new in cooperative education, the department conducted such a course prior to the war, with splendid results. The present series of conferences requires five days for completion and is in session Monday through Friday, during the afternoons. The course has been given wide cooperation in the trade and is supported by the Southern California Radio and Electric Appliance Assn. Dealer and salesman response has been very encouraging and the program is attracting capacity attendance.

Each phase of the program is handled by an expert in his field, drawn from among the top sales and production executives in the Los Angeles area and from functional supervisors of the department. Through this industry cooperation, those in attendance can avail themselves of the cumulative experience of some of the key men in southern California's merchandising organizations.

Instruction is supplemented with charts, graphs, motion pictures and practical demonstrations of equipment. Group discussions are encouraged and the trainees participate freely. The resultant exchange of ideas is of mutual advantage.

Complete familiarity with the product is a strong selling tool and the course presents a graphic outline of the construction and operational features of the major electric appliances. Cutaway models are used in explaining the salient features of the equipment.

A factory representative instructs the group in electric water heater construction. The average dealer and salesman has not yet built his sales story around the invisible features that make the electric water heater superior. Included in the talks are the features of tank, shell, insulation methods, heating elements, thermostats, heat traps, diffusion valves and drains. Element wattage is correlated with the gallonage specifications of the department, which have been calculated to insure a plentiful supply of hot water at all times and is based upon the normal occupancy of the home. The group is also given an interpretation of the off-peak operational characteristics as applied to electric water heating equipment in Los Angeles.

The simplicity of the electric range is stressed in the cooking demonstrations. Mrs. Mercedes Gaffney, long-time veteran in home economics, convincingly proves the speed, safety, convenience, and flexibility of electric cookery. This phase of the program includes the preparation of complete meals before the class, with a minimum of time and labor. Mrs Gaffney points out the heat-storage capability of the units and oven, the remarkable speed in boiling water and the best applications of the surface elements, oven and cooker pot. These sessions equip the salesman to effectively present the electric range, even to the "tough" prospect.

Modern salesmanship requires intelligent application of scientific and practical methods if a large sales volume is to be realized and maintained. Lectures, motion pictures and demonstrations are used to aid the trainee in acquiring the newest techniques. The value of "preapproach" informa-

Swanson, instructor, graduates both an old timer, Lou Willis, regional manager, Admiral Corp., and newly discharged veteran, R. T. Knight, salesman for Culbreath Co., at left, with Howard Burdick. Right, a class in session

tion, proper methods, convincing presentation of the sales story and a punch close that will clinch the order, form the basis of instruction. Sales managers from some of the largest manufacturers and distributors of electric appliances in the country orient the group in selling practices that have proved their worth.

Recognizing that the dealer must have a thorough picture of the potential market if his long-range planning is to be adequate, government statistics, census reports and independent surveys are provided to indicate what can be reasonably expected in the Los Angeles metropolitan market during the coming decade. Particularly valuable is the material on range and water heater replacements and the calculated demand for new installations. Data on population trends, new home construction, and other such information are made available.

The Department of Water and Power kitchen planning service is one subject of the program. Basic kitchen types and arrangement of equipment are explained. Information is also given on the illumination, space heating, appliance repair, and other such free advisory services rendered by the utility. The need is shown for adequate wiring and service entrance facilities, particularly in their relation to the future sale of electrical products.

Rates and requirements for service of the department are outlined in some detail. A full understanding of this subject is invaluable in the competitive selling of major electric appliances in Los Angeles. The graduates of the institute are better able to correct popular misconceptions about operating costs through such knowledge.

Additionally, a working explanation is given of certain other department policies that relate to the sale or installation of major home appliances. The retail dealer and building industry cooperative programs are outlined. Detailed information is furnished on the wiring reimbursement policy. This latter has proved of inestimable value in offsetting the somewhat higher initial purchase and installation costs of electric ranges and water heaters and has had a direct bearing upon the increased acceptance of these appliances in Los Angeles.

The subjects covered in the sessions are outlined below:

Monday—Registration; inspirational talk; potential market; cooking demonstration; construction of electric water heater; selling principles.

Tuesday—Nine advantages of the electric water heater; rates and requirements; cooking demonstration; ten advantages of the electric range; selling process.

Wednesday—Successful selling; wiring reimbursements and service; construction of the electric range; distributor relations; review quiz.

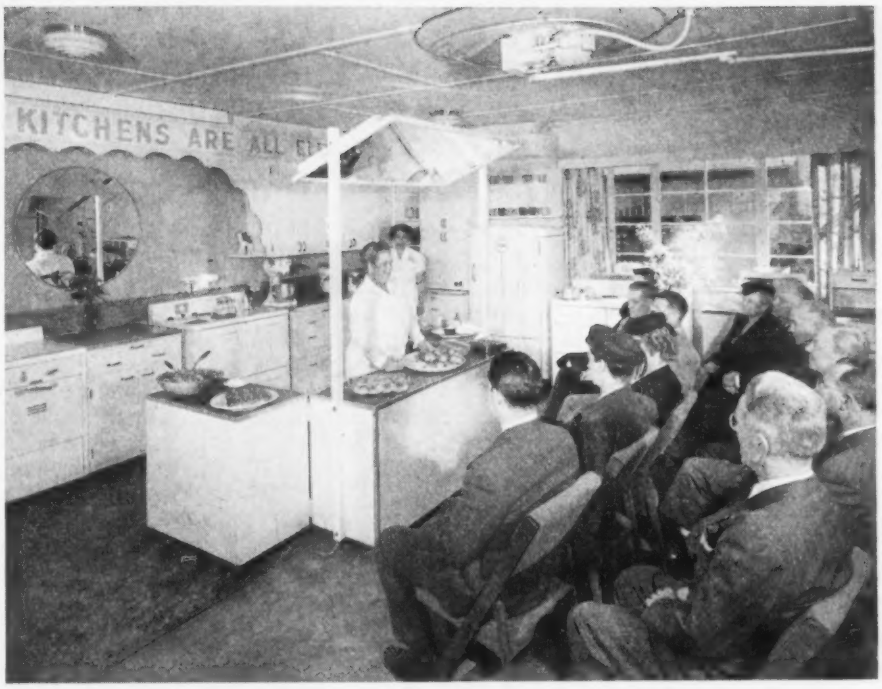
Thursday—Kitchen planning; practical selling; sales training film; Department of Water and Power dealer relations; answers to sales objections.

Friday—How to get prospects; cooking demonstration; demonstrations by students; review quiz.

The institute is under the supervision of P. J. Swanson of the residential sales section, Business Agent's Division, Department of Water and Power. Assisting in the demonstrations and lectures are William T. Bauer of the Bauer Mfg. Co.; S. B. Maher, General Electric; J. C. Wogan, Sues-Young; B. F. Olson, Westinghouse; J. W. Doan, Frigidaire; E. M. Frellson, Hotpoint; B. G. Sanderson, Electromaster; and P. W. Thelander of the Los Angeles City School System.

Reaction to the training has been consistently enthusiastic. Typically, Lou Willis, regional representative of the Admiral Corp. and a sales executive for a quarter of a century, after himself completing the first of the new courses, remarked, "I value the school very highly. It is well worth the time of any salesman or dealer."

Graduates find themselves better equipped to make a full and convincing sales presentation. The practical merchandiser recognizes that the period of effortless selling will not last indefinitely. As production approaches the higher levels made possible by wartime technological improvements, there will be a more rapid flow of equipment into retail channels. The dealer who would be prepared for the time when selling must again be based upon relative values, rather than scarcity of the product, must insure that his selling force is capable of volume sales in a highly competitive field. The Dealer Sales Training Institute is one solution to that problem.



Electric cookery presented with an eye both to homemaker and salesman by Mrs. Mercedes Gaffney. By actual cooking she demonstrates the advantages of an electric range, anticipates questions that will be asked and gives the answers

Peninsula Stores

Central Electric Co. has recently expanded to Palo Alto and plans a new store in Redwood City on the main highway, to open about May 1, according to Everett Carlson, manager. Recently added to the staff have been Kenneth Rexford, who is accountant and auditor for the three offices and Earl Peak, son of the late former president of National Electrical Contractors Assn., Peak, who recently left the Army as a lieutenant colonel, is estimator and engineer. Another addition to the staff is George Brochan, formerly with L. J. Meyberg Co., who is now purchasing agent.

Although this old-time contracting concern specializes in wiring and construction work in the San Francisco headquarters, the Palo Alto and Redwood City stores will feature home appliances and do extensive home wiring. The Palo Alto store has a Bendix and Norge Franchise, and that in Redwood City will be a G-E franchise operation. Other lines of major and traffic appliances will also be carried.

Here's What the West's Appliance Sales

There's a mountain of business from the backlog, the obsolescence,

Editor's Note—As lead off man in a symposium of speakers at the spring meeting of the Pacific Division, National Electrical Wholesalers Assn., at Fresno, March 15, O. R. Doerr, general sales manager, Pacific Gas and Electric Co., presented a cleverly illustrated talk, *The Appliance Market*, which is reproduced here about as it was given. The cartoons by R. D. Moore, of PG and E, were made into Kodachrome slides, reproduced here in black and white (to their loss), and Doerr made a running comment with them somewhat as reported alongside the pictures on this and facing page.

FIRST I will submit some facts and forecasts bearing on the principal factors which affect the appliance market, and then present the utility viewpoint. The information is gathered from the eleven Western states.

People make markets. This shows what has happened and is happening to us, population-wise, in the West. This increase is due to (1) war workers, (2) returning veterans. If this increased population can earn salaries and wages it will be a good market.

The domestic meter increase for 2½ million population is approximately a third, or 750,000. Each of these 750,000 meters represents sales of appliances not present before the war. They are wired homes or flats or apartments, and each requires a stove on which to cook, a refrigerator and small appliances. These new as well as the old customers have definite buying intentions. Our survey showed 12 out of the first 18 choices of things they intend to buy are appliances.

It is a paradox but despite shortages of appliances the kilowatt-hour usage has increased approximately 50% in the last five wartime years.

The present average is 1,700 per residential customer. The low for the West is 750, the high is 4,000. Most utilities are shooting for an increase in the next five years of from 50 to 100% more. That means promotion and aggressive action.

In 1945 appliance sales were less than 1/10 the normal volume. The investment per customer dropped from $40 in 1940 to $3.39 in 1945. We know that with appliances back on the dealer floors we can equal or exceed the $40 per customer average investment.

We think that the obsolescence of appliances from the war years alone will increase sales by $105,000,000. A field survey of northern California showed us that 47% of electrical appliances in use are under nine years old, and 53% over nine years.

The 750,000 new customers since 1941 should represent an unsatisfied demand of $70,000,000 in sales.

Outlook Is Like for the Coming Year If—

and the new population, but it's on short margins. Yet let's face it

O. R. Doerr
General Sales Manager, Pacific Gas and Electric Co.
San Francisco

Here is the accumulated $300,000,000 market. The plus at the top is defined as those new devices not yet on the market and whose total cannot be estimated. These are home freezers, laundry driers, infrared lamps, etc.

IMMEDIATE MARKET-OVER
300 MILLION DOLLARS
NEW DEVICES (PLUS BUSINESS)
UNSATISFIED NEW CUSTOMER DEMAND
70 MILLION
REPLACEMENT-OBSOLETE APPLIANCES
105 MILLION
PREWAR ANNUAL SALES
125 MILLION
RELATIONSHIP OF MERCHANDISE VOLUME TO UTILITY REVENUE
$300,000,000 MERCHANDISE SALES = $21,000,000 IN DOMESTIC REVENUE TO THE UTILITY.
RETAIL OUTLETS
1940
1946
6,331
10,032
VOLUME OUTLETS X MARGINS − OPERATING COSTS = PROFIT OR LOSS
EXAMPLE I
$330,000,000 / 10,000 = $33,000 x 35% − $11,550 − $10,824 = $726
OR 2.2% PROFIT
EXAMPLE II
$330,000,000 / 10,000 = $33,000 x 31% − $10,230 − $10,824 = ($594)
OR 1.8% LOSS

The market is there, but there are disturbing factors. These are: 1. Increased costs of distributing merchandise. 2. Competition through unsound methods and 3. wiring obstacles to the sales of major appliances.

Does this tremendous market mean *profit* for *all* branches? Or is it baloney?

The utility picture is bright. From this gross it means about seven cents per dollar of sales volume.

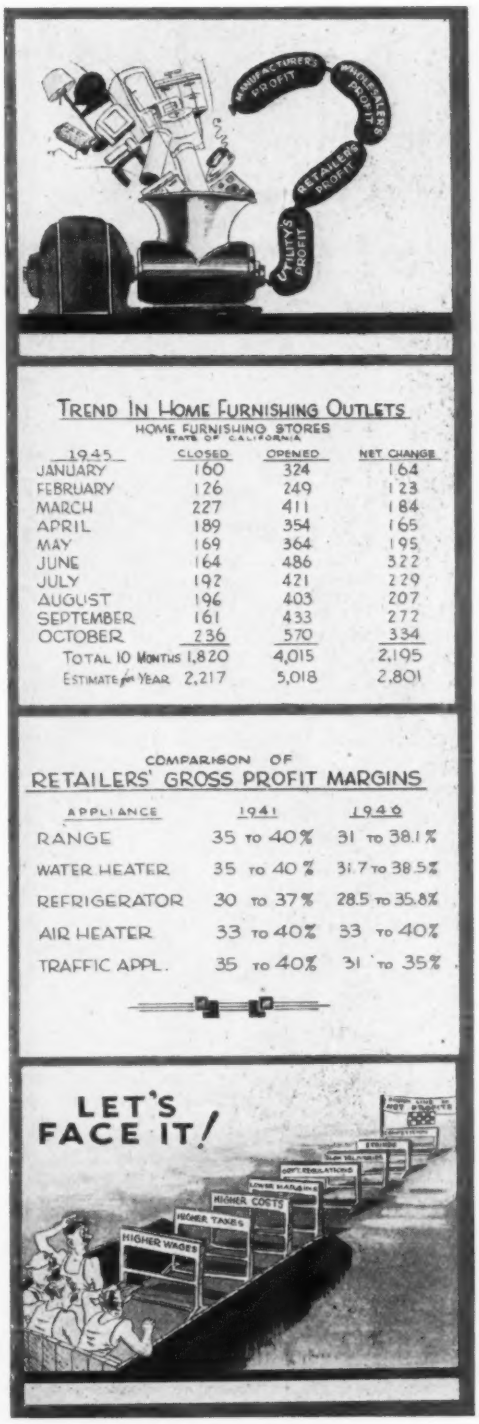
Let's look at the dealer situation. This chart is taken from the quarterly reports of the California Board of Tax Equalization, and hence is for California. but a similar situation holds in other Western states.

A retail outlet survey for the eleven Western states, just published (ELECTRICAL WEST) with information as to dealers, gathered through the utilities, shows almost a 100% increase in outlets.

But look at what has happened to retailers' margins. Cuts are as deep as 8%.

Work this out in simple arithmetic and what used to be volume enough for a profit now may bring a loss.

The track ahead to our goal has all these obstacles set up to hurdle. There is not much we can do about them by complaining. So let's face them as we have others in the past which we found we could take in stride.



1945	CLOSED	OPENED	NET CHANGE
JANUARY	160	324	164
FEBRUARY	126	249	123
MARCH	227	411	184
APRIL	189	354	165
MAY	169	364	195
JUNE	164	486	322
JULY	192	421	229
AUGUST	196	403	207
SEPTEMBER	161	433	272
OCTOBER	236	570	334
TOTAL 10 MONTHS	1,820	4,015	2,195
ESTIMATE FOR YEAR	2,217	5,018	2,801

COMPARISON OF
RETAILERS' GROSS PROFIT MARGINS

APPLIANCE	1941	1946
RANGE	35 TO 40%	31 TO 38.1%
WATER HEATER	35 TO 40%	31.7 TO 38.5%
REFRIGERATOR	30 TO 37%	28.5 TO 35.8%
AIR HEATER	33 TO 40%	33 TO 40%
TRAFFIC APPL.	35 TO 40%	31 TO 35%

Entire Industry Huddles, Decides Play

Northwest Electric Light & Power Assn. Business Development meetings hear from dealers, contractors, distributors, manufacturers

EXPLORING markets, sales methods and sales tools in all fields of appliance and kilowatt-hour selling, the Business Development Section of the Northwest Electric Light & Power Assn. gathered for its first postwar meeting at the Multnomah Hotel, Portland, April 15, 16 and 17. Sandwiched in with these discussions were discourses on the subject of the industry's relation with the public, indicating that while some headway had been made in recent years, a tremendous job still needed to be done.

With a program designed especially to bring in and hear from the five principal branches of the electrical industry, the meeting attracted a number of appliance dealers, electrical contractors, distributors and manufacturers, beside utility people of the five Northwest states and British Columbia. Registration ran over 250, nearly five times the attendance recorded at these meetings during the war years.

Under the gavel of J. M. McKay, Portland General Electric Co., section chairman, who presided at the opening session, James H. Polhemus, PGE president, opened the meeting with a welcome to the delegates which emphasized a broad-gauged approach to selling utility service. Drawing on the history of the growth of business during the war, he suggested a redirection of business development effort, stating that, "it will profit us to spend less effort on refining our own product and selling it intensively in the narrow sense, and to spend more effort toward increasing the extent of other people's ability to buy, through the medium of a broadened selling program designed to expand to the fullest possible potential all the wealth producing enterprise of the community, as well as that production which in the future we can bring within its confines."

In responding to the address of welcome, Patrick Johnson, Puget Sound Power & Light Co., president of the association, told of the decision in 1943 to open the doors to appliance dealers and electrical contractors, with the intent of making the association a common meeting ground and a forum for expression of these groups along with the manufacturers, distributors and utilities. It is not the intent to have this association take the place of manufacturers associations, jobbers, dealers or contractors associations, explained Johnson, but here, at last, is one medium through which all these groups can gather in one place and bring forward their individual problems and gripes for the whole industry to hear and heed.

In line with the theme of the opening address, the meeting learned of the launching of Research Advisory Service by eight member utility companies of the association. This service, instituted ten years ago by Lt. Col. Bert H. White of the Liberty Bank of Buffalo, and now operating through banking sponsors in various parts of the country, places at the disposal of industrial customers of the sponsoring utilities the know how of over 900 laboratories in private industry, educational institutions and government, for the solution of processing, marketing and management problems. Col. White was present at the meeting to tell how the service could be operated by each company in its own territory to aid industrial growth. Ladner V. Ross of Washington Water Power Co. will direct the service for the association, being temporarily on loan from his company.

The industry's public relations came in for review by advertising experts and company executives. Kinsey M. Robinson, president of Washington Water Power Co., pointed out that generally speaking the relations of individual companies with the public were good but that industry as a whole was in disrepute. Rates have nothing to do with this situation, he asserted, since, in many cases, utility companies with higher rates enjoy excellent relations in their own communities. He made a plea for a more positive stand by industry executives on legislative matters, with particular respect to over-all problems such as taxes, tax-free operations of government power enterprises and cooperatives. He pointed to the good work being done nationally by the cooperative advertising of some 170 business-managed electric companies.

Ed Dunning, vice-president of N. W. Ayer & Son, New York, was present to tell the results of this advertising in the four years it has been running, as revealed by a survey which showed progress in several directions toward which the advertising had been applied. In the past two years, the percentage of people preferring private electric company operation to all forms of government operation has stepped up from 42% in 1943 to 51% in 1945. By a score of three to one, the people say their rates are reasonable rather than too high. Now only one-quarter of the people are still critical of the profits made by privately owned, business-managed companies. Dunning cautioned, however, that, while progress is being made, there is still a large job to be done to make the public fully understand the advantages of private ownership and business management in the utility field.

Ashton B. Collins, founder of Reddy

Johnson Bonnett McAllister Jack Kruse Hall Ross Bakeman

Robinson Dunning McKee

Kilowatt, stated that the utility industry had to get down to the grass roots in telling its story. It cannot select its audience because it deals with everyone, the uneducated along with the educated. One field left uncultivated in the past has been the young people, of which there are two and one-half million coming of age each year. The time to make these youngsters familiar with the nature of our business, so that they will understand it better when they become heads of families and housewives and commence to use the service, is in the formative years when these boys and girls are in school. The necessity for selling all the features of appliances has passed, since they are now pretty much taken for granted. "We should tell the institutional story back of the outlet," he said. A feature of the meeting was the first showing in the Pacific Northwest of *Reddy-Made-Magic*, a technicolor cartoon movie, telling the story of electricity in simple and entertaining terms, featuring Reddy Kilowatt.

George R. Sommers, Sylvania Electric Products Inc., San Francisco, speaking on *Lighting from a New Sales Viewpoint*, pointed out that, with the present advancement in light sources and lighting technique, the shortage of inventories and the unprecedented demand, we are in a fine situation to "do wrong." We should keep our selling standards high so that the public will get the full benefit of technological advances. "Let us teach and demonstrate to the retailers, the factory men, and the home owner that modern lighting can do a multitude of tasks beside the obvious and assigned duty of overcoming darkness," he said.

The high standard of living in the American home will go even higher through the application of electricity to many new comforts and conveniences, it was shown dramatically by Elbert Kramer, Better Homes Department, Westinghouse Electric Corp., Los Angeles. The bottleneck to this higher standard will be home wiring, unless the industry does something about it. A serious bottleneck exists today in 95% of American homes, which must be corrected before these homes can enjoy the broad use of electrical services, he said, and proceeded to point out what his company was doing about it through the issuance of printed matter and the new Disney Technicolor cartoon movie, entitled *The Dawn of Tomorrow*, which he showed. Architects and the building trades are the key people to open this bottleneck, he said.

In opening the session devoted to an airing of the problems of manufacturers, jobbers, dealers and contractors, Henry Kruse, Puget Sound Power & Light Co., chairman of the sales promotion committee, outlined a brief history of the evolution of the electrical industry from the days when it was a purely technological business to one in which selling is a dominant factor as with any other business on Main Street. He brought out the fact that securing of customer acceptance of electrical appliances by utility companies had been superseded by straight merchandising of these appliances by a multitude of retail dealers. He introduced as the first speaker on this program, G. Langtry Bell, an appliance dealer of Vancouver, B. C., who is B. C. director for the new Canadian Association of Radio and Appliance Dealers. Bell defined an electrical dealer as one who maintains a place of business adequate for effective display of a representative line of merchandise which is subject to a franchise, who keeps such personnel as will effectively promote the sale of such merchandise, and who provides adequate facilities for the servicing of it. He stated that his association believes in an aggressive promotion to the appliance industry with all branches of the industry carrying their fair share of this promotion. He pointed out that sound policies under good business ethics for all dealers would benefit utility companies, manufacturers, distributors, contractors and the public, as well as benefitting the dealers.

Mayer McKay

Arnold Kuhnhausen, veteran appliance dealer of Portland, and president of the newly organized Northwest Appliance Retailers Assn. in that city, elaborated some of the principles fundamental to establishing a sound retailing business in electrical appliances. He decried a number of evils tending to creep into the business, such as back door selling by distributors, direct buying by cooperatives for the purpose of freezing out distributors and dealers, and the practice of allowing unfair trade-in values. It was necessary, he maintained, to establish a sound business philosophy in this field of retailing as in any other merchandising business.

The manufacturers were represented by R. G. Chamberlain, vice-president of Hurley Machine Co., Seattle, who advocated a study of city building and plumbing codes to prevent their becoming so strict as to preclude the economic installation of such new appliances as the dishwasher. He also advocated the formation of a program with architects, to see that they are informed as to new appliances coming on the market such as dishwashers and clothes driers, and urged that the industry be ever on the alert for the promotion of new devices that would aid the industry in promoting an ever-growing use of electrical services.

L. D. Pulsifer, Westinghouse Electric Supply Co., Seattle, speaking for the distributors, urged the association to foster legislation to control the standards of appliances offered to the public. He pointed to the obligation of the distributor to use care in the selection of dealers to the end that there

Roach Collins

would not be too many dealers insufficiently financed to carry their share of selling and promotion. In this connection, he cited the large number of returning veterans being lured into the appliance business thinking it would lead to easy prosperity. It is going to take a good hard-headed business man, well financed, to stay on top in this era of short margins, price control and shortage of merchandise.

The electrical contractors were represented by R. D. Horning, secretary of Seattle's Electrical Contractors Assn., who stated that his association was founded on two simple ideals: "Channel all thinking in terms of the welfare of the whole and be decent whether others are decent or not." The defining of the contracting industry in terms of this philosophy has improved that business in Seattle over the years. He told of his association forestalling an attempt on the part of some contractors to buy direct from the manufacturer and freeze out the distributor, so that Seattle now enjoys excellent jobber-contractor relations.

A plea for a free pricing market in the building trade was made by Col. C. W. Huntington, executive secretary of the Home Builder's Assn., Portland, as the means by which production will be stimulated fast enough to overcome the housing shortage. Restrictions and controls of materials and prices, said Col. Huntington, are inimical to the American way and should be stopped. If relief can be given to manufacturers by the lifting of price controls, goods will flow into the market and houses will be built faster than at any time.

This session was concluded by an analysis of the market for electrical appliances in the eleven Western states by George C. Tenney, editor of ELECTRICAL WEST, San Francisco. A survey conducted by this publication indicated that the 1946 potential was $330,000,000, if conditions had permitted the free flow of appliances to the market early this year as had been anticipated. The number of retailers in this region has increased by about 4,000 to 10,300, and Tenney pointed out that a number of casualties could be expected, because not all of the new ones are sufficiently financed to weather the continued dearth of deliveries.

On two half-day sessions of the three-day meeting, the several bureaus of the Business Development Section were given an opportunity to examine their problems intensively in their own round-table conferences. The Adequate Wiring Bureau, with J. F. McAllister, Utah Power & Light Co., chairman, newly organized in this section, examined the many plans for promoting the sale of adequate wiring to the public. Its findings were crystalized in a resolution advocating the sponsoring of local organizations, composed of all branches of the electrical industry, including contractors, dealers, jobbers, manufacturers and utilities to promote an organized program to take full advantage of the national program the Adequate Wiring Bureau now has available. It also advocated the adoption of an adequate wiring plan similar to that outlined in the handbook *Residential Wiring Design*, prepared by the Industry Committee on Interior Wiring Design.

The Advertising Bureau, under Kimball Jack, Washington Water Power Co., chairman, recognized the Number 1 problem to be the preservation of the electric utility industry as a privately owned business-managed industry, and spent a portion of the time of their conference in exploring techniques for getting this story over to the public. They also examined the community development programs put on by various utility companies with the view to aiding other community organizations in expanding and assisting local industry. The group recognized the broad field of public relations encompassed by company advertising and publicity departments, and suggested the bureau's name be changed to indicate such broadened scope.

The need for more salesmen of commercial and industrial lighting and power was found by the Commercial and Industrial Sales Bureau, under the chairmanship of O. C. Mayer, Idaho Power Co. Several of the returned veterans in this field expressed a desire for refresher courses in commercial lighting, cooking and heating. The bureau agreed to re-establish the electric cooking conference and other courses conducted by the association before the war. The bureau also felt the need of re-establishing the data sheet program on commercial and industrial heating to cover installations where new technique has been employed. To aid salesmen in keeping abreast of new developments in these fields, it was thought desirable to circulate periodically a bibliography of published material. C. P. Merklin of Norris, Beggs & Simpson, property managers of Portland, advanced the idea that, in modernizing the lighting in offices, the tenants should buy and own the lighting fixtures and be permitted to take them out on the expiration of the lease, as they would do with their regular office furniture.

The Rural Sales Bureau, T. K. Dimmitt, Puget Sound Power & Light Co., chairman, reiterated its judgment that farm electrification should continue along the lines employed by the utility companies before the war, of selling the farmer electric service that would increase his yield, or improve the quality of his crop, or reduce his costs. Several companies are reinstating their farm service departments headed by agriculturally trained men. F. E. Price, Oregon State College, Corvallis, told of the large increase in sprinkler irrigation in western Oregon and cited this development as among the most profitable farm uses of electricity yet produced in the research carried on in the college. June Roberts, Washington State College, Pullman, pointed to refrigeration as a major market for farm power and discussed the design and construction of walk-in freeze units for the farm. Hobart Beresford, University of Idaho, Moscow, told of the developments in that state in recent years whereby electricity had contributed to agricultural prosperity.

Four committees were heard from in the Residential Sales Bureau, chairmanned by Guy Davis, Pacific Power & Light Co. Home service is again appearing as a major factor in the promotion of electric service in the home, according to Lucille Ramirez, Washington Water Power Co., chairman of the home service committee.

An adequate department in this field, she stated, will require well-educated, highly specialized girls with outstanding personality, ability, intelligence.

J. C. Plankington, chairman of the water heater committee, reported on the most recent survey among member utility companies as to their willingness to permit NEMA-EEI standard water heaters to be connected to their lines, naming ten permitting these standards. Some companies consider these standards too low in wattage per gallon.

The electric house heating research committee, under H. C. Bender, Washington Water Power, chairman, which has been working for about a year compiling basic data on house heating, has developed a survey sheet for use by all companies that will insure uniformity in the manner of accumulating these data. W. L. Sharp, Portland General Electric Co., told of that company's current study of 700 residential electric heating installations in the city of Portland, which is expected to show peaks, load factors, diversity and costs of house heating service.

W. B. Bonnett, Puget Sound Power & Light Co., chairman of the electric home committee, presented the results of a survey among member companies of sales promotion plans and techniques to be applied in the promotion of electric kitchens, kitchen planning, quick freezing, garbage disposal, automatic laundry and new home appliances. The committee recommended consideration be given to using the "Four Star Home" as a promotional vehicle for the development of complete residential service.

ELECTRICAL WEST
Sales Guide

FOR THE ELECTRICAL MERCHANT OF THE WEST © MAY 1946

What's Going On?

By John Adams

WHETHER yours is a one-man organization or a large organization, you must be organized so that you know "What's going on."

Many newcomers have never run a business before, but have gained their business experience working for others. They were formerly salesmen, accountants, bookkeepers, electricians, clerks, mechanics, or engaged in any type of work imaginable. Each one will make his new venture strong in his own line of work, but may overlook weaknesses outside his experience unless he keeps himself informed.

Most of you old hands at running electrical appliance stores have been hard beset, because of lack of merchandise, to remain in business. You have had to be opportunists, grabbing at what dollars opportunity offered. Perhaps you have allowed your once excellent business setup to deteriorate. It is well to re-examine such a business, to ask yourself—

1. **What is going on marketwise?**
   (a) Do you know the results of surveys which indicate buying intentions in your area?
   (b) Do you know which income groups have indicated their buying intent?
   (c) Do you know what income groups reside in your area? Or, put another way, how much money have your prospective customers to spend?
   (d) What is your share?
2. **What is going on in your business?**
   (a) What are the functions of an electrical dealer?
   (b) Are you organized to contact and serve your customers?
   (c) Do you know how much it costs you to be in business?
   (d) How much income can you count on from your estimated share of the market?
   (e) How much of this income must be allotted to cover the functions of your business?

Regardless of whether yours is a large organization or a one-man organization, there are certain fundamental functions or duties, none of which can be omitted if you are to be successful.

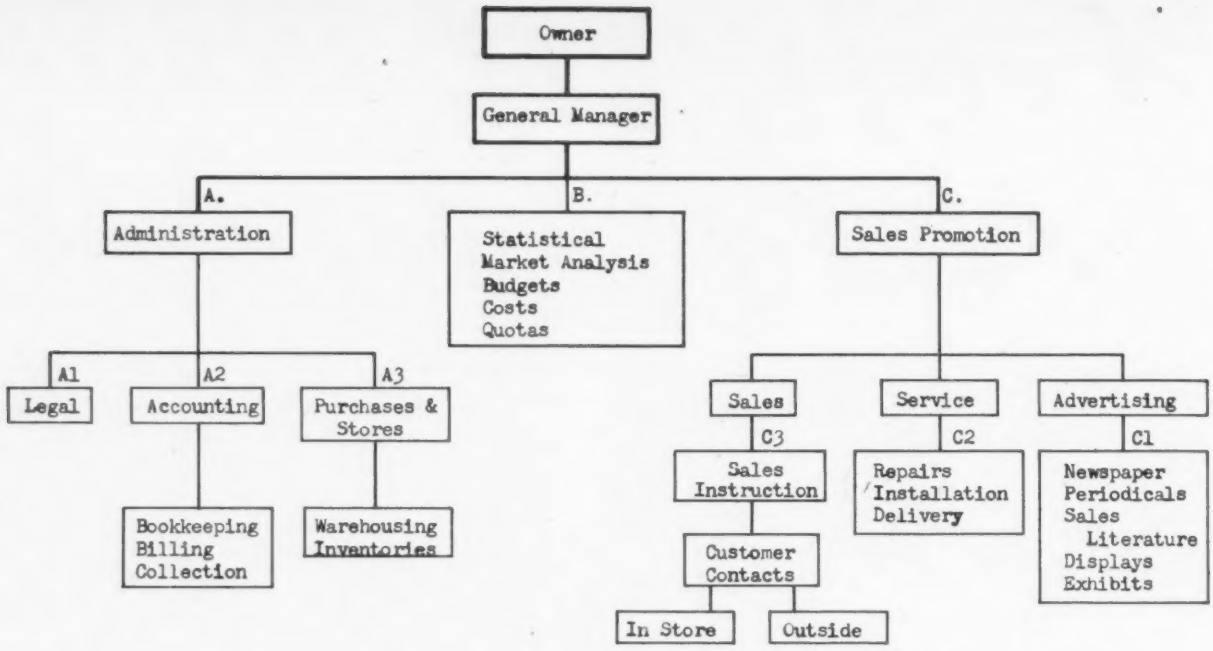
The chart on next page endeavors to list these basic requirements. It is not complete enough for a large organization and for such it must be amplified. However, no matter how small you are, you must perform these functions. A one-man organization, for instance, must assign his time so as to complete all these duties.

An organization of several people must decide to whom responsibility for accomplishment of these functions is to be assigned, and probably will need to combine related functions. The experience and training of personnel available may affect the items combined. The chart also shows a suggested minimum organization for an electrical appliance dealer. Some of the reasoning back of this chart proceeds as follows:

1. It is obvious that any organization must have an owner, who may be the general manager or operating head of the business. Someone must be responsible for the direction of the various functions, balancing one against the other, and deciding on future courses.

2. The manager has three major functions to perform:

(A) An Administration Unit to tell him



where his business is and where it has been as well as to perform routine duties:

(A1 & A2) The Legal and Accounting Functions can be and often are accomplished by hiring outside talent on a retainer or fee basis. However, outside services can only assist the manager of the business by giving him facts and advice. The manager still must **understand** and **interpret** the facts and advice, and make the final decision.

(A3) The Purchasing Function, however, cannot be farmed out; it must be performed by someone within the organization. It is not as simple a process as some think. Lack of foresight in purchasing and keeping on hand adequate supplies even in a small store can seriously handicap sales, just as overbuying or poor buying can wreck your business. Linked with purchasing is an inventory control that can protect you from over or underbuying.

It is important that controls be set up to pay bills within the discount period. These discounts may actually represent a large portion of your profits. A discount of 2% on 65% (based on 35% average discount from your wholesaler) is 1.3% of gross sales. If your gross sales are $2,000 per month, you can add to your profits $26 per month, or $312 per year.

(B) An Analytical Unit must be maintained to project the business operation into the future and assist in deciding where the business is going. The importance of this function is often overlooked. It is a function of top management and should report directly to him and not be subservient to either administration or sales promotion. This function will gather statistics and estimates from the two other main functions and from outside sources of all kinds:

(1) Chambers of commerce
(2) Trade associations
(3) Published surveys (this includes summaries of sales compiled by your utility)
(4) Bureau of Census reports,
(5) And many others, including market studies reported in "Electrical West," etc.

A study of such surveys and statistics can determine the potential market much more accurately and you can then decide on your share. By using this method, your degree of success and the amount of your profits can be increased.

(C) Sales Promotion is, of course, the very life of your business. All the rest of your business must be pointed to serve this function. In fact, the salesman who gets the name on the dotted line is the man the business is working for. Nevertheless, without the help of the other functions, he is helpless. In the chart are shown three divisions of sales promotion, all of which are considered essential.

(C1) Advertising is of course necessary, not only to identify your store and create a favorable impression but also to presell and pave the way for the actual sale. Advertising not only includes newspaper and other periodical ads but getting the proper sales aids and descriptive literature for the use of the sales force.

Advertising also includes store and window displays, bill boards, signs and post-

ers, and special promotional presentations such as before women's clubs or cooking schools, and special exhibits such as fairs or group merchant shows. The value of these types of advertising can only be judged by the number of good prospects produced. If a special presentation will produce the names of 300 reasonably good prospects already partially sold by the presentation, an expenditure not to exceed $300 would be profitable, provided you have the sales force to follow up on these leads within a reasonable period of time.

(C2) A Service Unit to assist your customers in maintaining their appliances is essential. This unit readily combines with the delivery and installation function where major appliances are sold. It is often possible to make a suitable business arrangement with a separate servicing agency to handle service for you on an independent basis. This is recommended only where it is absolutely necessary and you cannot set up your own department. The reason for this is that your **sales depend on the customer contacts you make yourself.** The customer contact factor is also the main reason sales and service are so closely related. If service is not geared to sales, it is apt to be poor service.

Your service unit can be a most productive source of sales.

(C3) The Sales Unit is the key unit without which your business cannot exist. Properly assisted by the other functions it must produce the revenue to keep the whole business going.

It must be carefully trained and directed. All too often, alleged salesmen are merely furnished literature and contract forms before being shown the front door with instructions that their prospects are outside it. Be sure and contact your utility and your distributor about sales training. Many of them have profitable sales training courses for your benefit.

The Sales Unit's progress will control the amount of your profits. It must not be hampered by lack of accomplishment of other business functions.

Basically what this is all about can be illustrated by considering a $100 sale. Suppose you have a 35% margin. You have $35 with which to pay expenses. With it you must pay:

Rent and utilities,
Equipment expenses, office and store equipment,
Legal expenses,
Warehousing and inventory expenses,
Advertising expenses,
Service expenses, including equipment,
Installation and delivery expenses,
Sales expenses
Management expenses,
Rent or interest on money borrowed.

And whatever is left over is the owner's profit. You can predetermine your success by budgeting your costs and planning your sales program.

A Buying Policy Should Please Also

Fifth of a series of good sense articles on business management.

By KEN HAMPTON

TO buy well, the merchant must know his market and his customers. He must know the price, the goods that his customers can afford to buy and he must know where he can obtain the best quality goods to sell for the price at which customers can afford to buy. The merchant is the purchasing agent for his community in the lines of merchandise that he sells. In his business he should be fully as well equipped to buy as the technically trained staff in the purchasing agent's office of a big corporation. When he opens his store to serve the community, he accepts a responsibility of being his customers' purchasing agent.

To do this he must know his community's seasonal requirements, he must know something of its habits which affect the consumption of the goods he sells, he must meet credit conditions.

To buy well, it is necessary that the merchant learn all about the products which he might buy and stock. The best place to get this information is from the salesman who wants to sell him goods. For buymanship that pleases people, the merchant must please the salesman who calls on him sufficiently well so that he will give him the information needed about the products.

One may assume that the salesman will

give him this information regardless of how he is received. This is not so because he cannot possibly put out his information unless he has a fair hearing, which is often not accorded him. Many merchants believe that it is best to keep their guard up against sales representatives, ruffle them unnecessarily and, in general, keep them at arm's length. The merchant is bound to suffer from this attitude. If one is to buy well, he should observe the following points as to how to please sales representatives:

1. Don't keep them waiting unduly. This not only wastes their time, it irritates and confuses them until they do not tell as good a sales story when they are finally given an interview, nor do they feel the kindly friendship for the firm that you want carried back to their factory.

2. Treat all salesmen with courtesy. Even if you don't buy their goods, at least you can have their respect.

3. Listen to the salesman's story with interest. An interested audience enables a man to present his subject best, and the merchant will arm himself with sales arguments to be used later, either for or against.

4. If you can't purchase his wares, tell him why. This not only is fair to him, but it gives him a reason to give to the factory which may correct the trouble and therefore make better wares available to you, or if it is caused by inventory averages or some conditions within the control of the merchant, it will give him a satisfactory reason for having spent his time with you and leave him free to come back with an offer that you may need badly.

5. Buy closely and as well as possible, because, as a purchasing agent for your community, you have an obligation to your customers to buy as cheaply as possible so you can sell to them at as low a price as possible. In doing this, deal fairly so that you will be respected.

6. Live up to the conditions of the sale There is probably nothing that irritates a factory or salesman more than having continual wrangling over special conditions such as additional discounts, allowances for freight, etc., which the merchant demands after the sale is closed, and often after invoices have been rendered.

7. Don't expect sales representatives to spend money to influence you. The merchant doesn't gain anything by having the salesman entertain him and his employees at dinner or elaborate parties. Do your buying in your office in a businesslike way, not over the luncheon table. If you want to dine later as a friend, well and good, but assume the obligations of friendship; pay your share.

8. Be loyal to those firms which have dealt well with you. It is almost axiomatic that in times of prosperity, the leaders always gain. This means that there is a greater demand upon the factory output than upon lesser brands; so in prosperity times, these leaders can and often do weed out desultory dealers of their product who have been hard to please or unfair in some of their attitudes in the past. Yet these very leader brands or brand names are the strength of your store because by public acceptance they have become profitable and, because of their leadership, enhance your standing in the community.

9. Take your fair share in the responsibility of introducing a new product. New products must go to the public through the merchant's store just as old, established ones do, but cannot unless the merchant spends money to stock them and to make an added effort to tell the public about them.

Customers are pleased by a buying policy that offers them:

1. As wide as possible a range of prices in the goods they are shopping for. This necessarily means a wide range of qualities. Customers like to make comparisons of the merchandise they select with both better and lesser grades. Afford them this opportunity.

2. In the price range in which they are buying the customers are pleased with as wide as possible a selection. In a grocery store they want to select a 15c can of corn from several brands. In a furniture store they want to inspect several designs in rugs at $150.

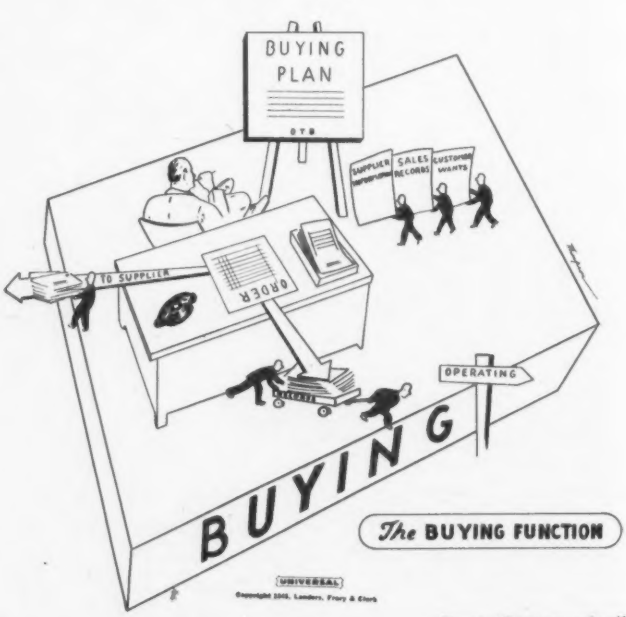
3. The customers want accurate information on when materials out of stock again will be available.

4. The customer's sense of importance is touched when the merchant is willing to obtain promptly merchandise not stocked. It is often good business to handle such merchandise at no profit to accommodate a customer. The merchant's buying arrangements should be such that this can be done promptly and without upset.

The function of a merchant is that of moving goods from warehouse to consumer. When the merchant stocks up on merchandise beyond the reasonable needs of his community, he begins to gamble on future markets. Yet care should be taken to carry sufficient stock.

Other conditions that affect the quantity of merchandise to be carried are the distances from the point of supply and the time that it takes the supplier to fill orders.

These are things which the merchant must weigh, but it is equally unwise to stock up on merchandise in anticipation of a price raise or to run out of merchandise anticipating a price drop. If such a practice were carried to its ultimate extreme, in one case all capital would be tied up in inventory and in the other case there would be no inventory at all.



The **BUYING FUNCTION**

From "Systemeering"

Frozen Food Clinic

Combined with a new idea in shows, a frozen foods clinic, the annual spring conference of the Bureau of Radio and Electrical Appliances of San Diego County will be held May 27, at U. S. Grant Hotel. The frozen foods clinic will occupy the morning and mid-afternoon sessions. It will present for the benefit of dealers, distributors and salesmen the most up-to-date information available concerning the entire subject of frozen foods, home and farm freezers and domestic refrigeration equipment.

The clinic is being presented through the cooperation of both the frozen food processors and the refrigeration equipment manufacturers. Its purpose is to enlighten the industry as to the facts about frozen foods and to present the sales points for the development of this new market. Various equipment manufacturers will also be given time on the program to present the virtues of their own makes.

J. Clark Chamberlain,, manager, plans to conclude the conference with subjects pertinent to the merchandise situation at the moment after making his customary thorough survey of the status and the forecasts prior to the meeting. The conferences usually attract leading West Coast distributors and manufacturers representatives in addition to local dealers.

Franchised

Recently announced Westinghouse franchise dealers include the following:

Loomis Electric and Appliance Store, Loomis, Calif., E. F. Shupe and Herman Gutierrez, partners.

Electric & Music Mart, 67 West Park St., Butte, Mont., Edgar H. Reeder, manager. Electric & Music Mart was established Feb. 1, as successor to Dreibelbis Music Co., in business for 31 years. Reeder was formerly with Commercial Credit Corp. and Wilson Motor Co. He was discharged as lieutenant (j.g.) from the Navy in September.

Bailey Hardware, Big Timber, Mont., owned by F. L. Bailey and E. J. Husebye.

Modern Home Appliances and Furniture Co., 1926 Lawton St., owned by A. Gubert, G. Voitoff and Paul Rodgers. Gubert and Voitoff are both electrical engineers.

Hedges Furniture Co. on B Street, Dixon, Calif., George T. Hedges, owner.

W. M. Rumsey, 724 Sutter St., Folsom, Calif.

Sorensen Electric Co., Main St., Suisun, Calif., Ed and Andy Sorensen, partners, electrical contracting firm.

Whipple's Home Appliance Co., 108 W. Stewart, Puyallup, Wash., newly established by M. D. Whipple. Associated with him are Messrs. Reilly, formerly of Boeing Aircraft, and recently of the Army Air Forces, and Middleton, in charge of the service department.

Riverdale Appliance Store, on Mt. Whitney St., Riverdale, Calif., of which Ted Bachman, Melvin Bachman and Richard Bachman are co-owners.

H. R. Basford Co., Zenith distributors in northern California, sent a picture of ordinary freight handlers taking the air freight shipment of Zeniths from the plane, but United Air Lines sent this charming stewardess and it is she whose picture gets in. It seems this was maiden trip of air freight service, and a maiden is more appropriate

D. E. Sanford Co., distributors of electrical appliances, fly around these days, as when Charlie and Mrs. Chinn, San Francisco manager of Sanford, were given use of Camfield Manufacturing Co. plane to make his calls in the East. Sanford will handle Camfield automatic toasters in the far Western territory

Roll Their Own

Three leading appliance salesmen who were formerly with the San Diego Gas & Electric Co. when that company was in appliance merchandising before the war, are now in business for themselves. The utility's National City salesman, Paul J. Eklund, has opened his own store, Eklund's Appliances at 8312 La Mesa Blvd. Eklund carries the Hotpoint, Easy and Admiral lines of major appliances, in addition to Packard Bell radios. Eklund has arranged for service repair and electrical installation facilities through Frank Higgins, who will operate out of Eklund's shop.

In Escondido, Fred Bulmer and Chet White, both well-known and popular salesmen for the utility in the Escondido, Ramona, Vista and Fallbrook areas opened the County Electric Co. in Escondido on Dec. 15. Included in the partnership is Martin Gehring, former utility repairman, who will manage the service repair problems for the company. Lines carried include Westinghouse, Maytag, Thermador, Electromaster, and Deepfreeze, in addition to a complete line of table appliances and oil heating equipment.

In La Mesa, George Stoltenberg has opened the Stoltenberg Appliance Co., at 8109 La Mesa Blvd. Stoltenberg will handle Westinghouse, Maytag, Zenith, Ironrite, and Deepfreeze lines, in addition to Royal Vacuum cleaners and a complete line of table appliances. Stoltenberg was a leading appliance salesman with the Parmelee-Dohrmann Co., 641 C St., San Diego, before the war.

Buying Intentions

Thirty-four and two-tenths per cent of San Diego County families plan an early purchase of some electrical appliance, according to results of a survey announced by the Bureau of Radio and Electrical Appliances of San Diego County. Of these, 53.6% will be purchasing appliances for the first time, and 46.4% will be replacing worn-out appliance models.

Of interest is the fact that of the 34.2% planning to make an early purchase, only 17.4% said they would purchase the first make available, while the remaining stated they would prefer waiting until they could make a choice. Of those indicating that they wish to wait, 47% had a definite make in mind, 13.1% believe that their appliances will be constructed of better material later, while 7.6% await new features and innovations which they expect the industry to announce after the first flush of buying has passed.

ELECTRICAL WEST

McGRAW-HILL COMPANY OF CALIFORNIA
68 POST ST. SAN FRANCISCO . 4

The all-industry magazine of progress, established 1887 and incorporating the "Electrical Journal," "Journal of Electricity, Power & Gas" and "Journal of Electricity." Contents Copyrighted.

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Misuse of Power

IT IS usually a sign of inherent weakness of position when the extremes of power are used in an attempt to gain one's way. Certainly the forever inexcusable war that has laid waste to half the world and burned up so much of its precious resources, is a lesson of that kind. Hitler and Hirohito, feeling they had not the soundness back of them to get their aims by legitimate means, resorted to their extreme weapon, military power, to take by force what they had no right to have otherwise.

Strikes are a similar weapon and their use similarly reveals inherent weakness of position. If a cause is just, there is no need to pull a gun to get it.

Boycotts are another such extreme weapon. To use the boycott ruthlessly to enforce otherwise unsound demands indicates an inner weakness that surely will cause whatever is taken by its force to crumble too, as did Hitler's empire, Napoleon's, Kubla Khan's. Things have to stand of their own justice.

If labor organizations want respect and ultimate success, surely it is poor generalship to attain their objectives by force. If their aims cannot stand on their own merits, they must be unsound, and, if unsound, not all the force in the world can make them right.

Labor is entering an era of power. Power is always dangerous to play with. It entails big responsibility, careful handling. An experienced lineman, working hot lines, makes every move with caution and only when he appreciates the consequences of what he is planning to do. It is the same with boycott power or strike power. They can electrocute the man who is handling them if he misuses them. In the case of a labor organizer, his strike can impoverish his own members if carried too far. Or it may kill off the business which makes the jobs.

Power is very tempting to a leader. It is intoxicating. It goes to the head. Its use seems to offer a short cut to results. But there is a law that runs throughout nature, discovered and expressed by Newton, "For every action there is an equal and opposite reaction." It is this reaction that makes the abuse of power dangerous to the misuser. This is a thought to sober up on. Power had better be handled with rubber gloves.

Hollywood Tells the Story

"REDDY MADE MAGIC," the new Technicolor cartoon film in which Ash Collins' humanized electrical character, Reddy Kilowatt, tells the story of electricity, sets a new high in industry educational programs. Anyone who would have dared to assert that the highly technical story of the development of electricity could be told simply, comprehensively and entertainingly in a cartoon movie would have been laughed into seclusion in times past. Reddy Kilowatt does it now with such simplicity and charm that a child of six or seven can understand and appreciate it. The Hollywood producers were told to turn out a non-technical story. To the confusion of engineers and technicians they have done their work admirably. The picture will be seen and thoroughly enjoyed by everyone—grown-ups and children alike.

When one considers the subject matter and the expertness of the performance in telling the story of electricity in a cartoon movie, he is almost tempted to wish that some brave and unconventional person would commission the same producer to tell the story of private enterprise in a similar manner. It could be done.

Not Only Price Control—

WHILE the fellow-travelers stand at street corners distributing handbills to protest the "murder of the OPA" and urge pressure letter-writing to congressmen, the real reasons why the OPA needs to be curbed and price control

abandoned in favor of natural law, are obscured in the emotional smoke screen being laid down by PAC. The appeals used in support of OPA are none of them factual or intellectual. All of them draw a focus on the most intense selfish and near-sighted appeals—fear of rents and food prices. None go back of these to see what is happening to property through neglect, to the causes of food shortages and price raises and black markets.

But worse than all of these more obvious aspects of OPA is something that always follows regulation. A private police force, an enforcing gestapo, an "enforcement and investigation" staff has grown up in OPA which has all of the bad features that developed in the prohibition detective force, with the added evil of being able to levy fines without court trial.

Recently there was introduced in Congress a copy of the instructions given to OPA investigators to enable them to trap those they were investigating into betraying themselves and others as to even little technical violations. These instructions were such as to make any American indignant that such trickery would be advocated by his own government's officers, his own public servants.

Electrical dealers and contractors who have undergone the investigation of some of OPA's sleuths bear out this technique. It was applied to them. And what is worse, the mental attitude of the investigator was that the dealer was guilty before he was proved so, and that the investigator failed in his own assignment unless he was able to find something on the victim. There was no inclination to help a poor man solve the riddles of regulations. He was supposed to know, or else—.

The issue of OPA has ceased to be price control for prevention of inflation. It has become one of keeping or kicking out a new form of spying and oppression, masquerading under the guise of friendship for the people.

You Have to "Know a Guy"

OUT of the confusion of reconversion, continued regulation, OPA administration and almost total strangulation of the American production machine, there has grown up what one of our readers characterizes as an "I-know-a-guy economy." He points out that, in order to secure almost any commodity from butter to whiskey or nylon stockings, or from electric motors to a coil of wire, one has to know the right "guy." Know the right "guy" and presto, meat, tires, an automobile, toilet paper, shirts, or an electric refrigerator will come forth as though a magic wand had been waved. If one doesn't know the right "guy," he must suffer and swear.

This is a serious commentary upon American business and American character. In its devious ways, black tone and under-the-counter technique, the practice is reminiscent of the prewar "I can get it wholesale days." Only in this new instance the price is usually up instead of down. The electrical industry was in a fair way of licking the wholesale racket before the war. Announced intent is that the practice will be eliminated entirely in the future. It is to be hoped that it will remain aloof from the "I-know-a-guy" technique. To become involved could conceivably lead to a revival of the wholesale racket. That would be bad.

AN Authority question is a straight political issue which would substitute national socialism for private enterprise in the development of electric power and other basic industries. A European dictator had no more autocratic control over civilian rights than would the proposed power authorities which would not only displace much private business but would make it impossible for the people to enter into many lines of endeavor because of tax-exempt government monopolies . . . The simple fact is that if you enact one of these Authority bills into law, you place the people of that river basin under a dictatorship that is without practical limitations, you make a mockery of state laws and state courts, and you institute an establishment which in its very nature will intrude itself into congressional elections and will seek to and succeed in shaping that public opinion which is the only check on its power. I contend that there is not a single legitimate objective set forth in these Authority propositions that cannot be better attained with existing government agencies—federal and state. I say further that under the language employed in these bills there is probably no field of endeavor into which the Authority could not intrude. The conclusions, therefore, seem obvious that these bills are intended to allow the Authorities to move into many fields of agriculture, industry and commerce and into the political and social life of the areas embraced. If those intrusions take the form of outright ownership of business, then we have opened the door to Communism. If they take the form of unwarranted regulation and interference with private business, then we open the door to Fascism. In either case we have laid axe to the rights of American liberty.—A. S. Cummins, president, California Oregon Power Company.

Inspectors Review New Code

Rocky Mountain, Utah and Montana Chapters of IAEI hold annual meetings, learn of the Code and new lighting complexities, discuss the need for state inspection of wiring and appliances

H. G. Ufer; Code; W. L. Gaffney

MEAT course at all three meetings of electrical inspectors in the Rocky Mountain states last month was the 1946 edition of the National Electrical Code. It was dished out in each case by "Chef" Victor H. Tousley, secretary-treasurer, International Association of Electrical Inspectors, Chicago.

At each of the three chapter meetings, the Rocky Mountain Chapter at Denver; the Utah Chapter at Salt Lake City; and the Montana Chapter at Great Falls, the remainder of the intellectual menu varied. The Denver meeting gave way to prevent conflict with the meeting of the Engineering and Accounting sections of the Rocky Mountain Electrical League at Pueblo (reported separately). The Utah Chapter meeting was combined with a lighting conference (reported separately). Lighting subjects also strongly flavored the Montana Chapter opening session Friday, April 12.

Rocky Mountain Chapter

Because the Denver members of IAEI meet each month at Code school after working hours, and because the program was shortened to a one-day session, attendance at Denver was small. D. G. Mulligan, engineer, Mountain States Inspection Bureau, chairman of the chapter, reviewed the past year's activities, principally its Code schools, attended by 25-50. At these schools, a number of journeymen electricians and apprentices attend. More than 300 copies of the last Code have been distributed during the past year, he said, which indicates the number of new electricians entering the trade. Active building and university and college courses all point to the need for inspectors to conduct educational work among those entering the business and for those who want to be brought up to date on the new Code.

As if the Fates themselves gave impetus to the plea of electrical inspectors for some means to ground portable lamps and appliances, the Rocky Mountain *News* in Denver, April 6, one day after the inspectors' meeting there, carried the banner headline, "Denver Girl, 10, Barely Escapes Electrocution on Light Switch." A ten-year-old girl, attempting to turn on a floor lamp while she stood on a hot air register, received an electric shock which "froze" her to the frame of the lamp standard. The frame of the lamp had come in contact with current-carrying wires inside the lamp standard, making the frame "hot". When the child's body provided a path to ground between the frame of the lamp and the furnace register she received the shock. Fortunately a resuscitation squad from the fire department was able to restore her to life.

Respect was paid to the memory of Leo Kelsey, general line foreman, Cheyenne Light, Fuel & Power Co., who as first vice-chairman of the chapter was due to succeed Mulligan. He died last November. Ford Chandler, an inspector for the Mountain States Bureau, also died on March 6.

Except for the two speakers at the noon luncheon, the remainder of the day was devoted to discussion of the new provisions in the 1946 National Electrical Code. This was conducted by Victor H. Tousley and questions from the floor were discussed and answered.

Meryl Mentzer, field representative for the Rocky Mountain Electrical League, asked the cooperation of inspectors in the industry-wide promotion program to improve both the quality and the adequacy of wiring. He outlined details of the National Adequate Wiring Bureau program and discussed the use of the Handbook of Residential Wiring Design recently issued by a joint industry committee.

Ted Foulk, Public Service Co. of Colorado, chairman of the RMEL wiring committee, then presented the Westinghouse Disney film, *Dawn of Tomorrow*, after which he urged inspectors to make use of this film with RMEL cooperation at meetings of public groups, schools, clubs, etc.

Past President V. D. Markham, city electrical inspector of Colorado Springs, urged the RMEL to develop some program for bringing more adequacy to FHA houses. He also an-

Victor Tousley, Chicago; Victor Moulton, Denver, secretaries; D. G. Mulligan, chairman, Rocky Mcuntain group

E. P. Hodges, new chairman; R. K. Foulk, Greeley, and V. D. Markham, Colorado Springs, at the Denver meeting

nounced that Colorado Springs now requires as a minimum a 60-amp. or larger service.

At the election of officers, concluding the meeting, E. P. Hodges, meter superintendent, Public Service Co. of Colorado, was elected chairman; Harvey Christenson, city electrical inspector, Rapid City, S. D., first vice-chairman; Carl Simon, principal inspector, Area Engineers, second vice-chairman; and Victor C. Moulton, electrical engineer, Mountain States Inspection Bureau, Denver, was re-elected secretary-treasurer. On the executive committee in addition to the officers are D. G. Mulligan, V. D. Markham, T. P. Treadwell, chief, fire department, Fort Collins; George R. Hubbard, electrical inspector, Boulder; A. P. Hall, electrical inspector, Fort Morgan; Austin Dunham, Anaconda Wire & Cable Co., Denver; Harold Vaughn, Cutler-Hammer Inc.; Tom Mackey, IBEW, Colorado Springs; R. K. Foulk, superintendent, meter department, Home Gas & Electric Co., Greeley; and Ralph Johnson, assistant manager, Sturgeon Electric Co., Denver.

New provisions in the National Electrical Code will be reported in more detail in another issue, after a study of the preprint is made.

Meryl Mentzer, field man, wiring, RMEL, at noon luncheon. At head table are V. H. Tousley, V. C. Moulton, D. G. Mulligan. Mentzer spoke on adequate wiring

Utah Chapter

Ray Powell, superintendent of light and power at Nephi, Utah, received a thorough workout as acting chairman to fit him for the chairmanship to which he was elected at the end of the Utah Chapter meeting. Harold S. Morr, Board of Fire Underwriters of the Pacific, called away from the city on business, was unable to preside, J. Hyde Stayner, Utah Power and Light Co. and former president, reading a letter from him appointing committees for the day's meeting. After a brief report on membership and finances of the Utah Chapter by D. J. Wolters, secretary-treasurer. W. L. Gaffney, secretary-treasurer of the Northwestern Section from Tacoma, read a letter from C. F. Alger, president of the Northwestern Section.

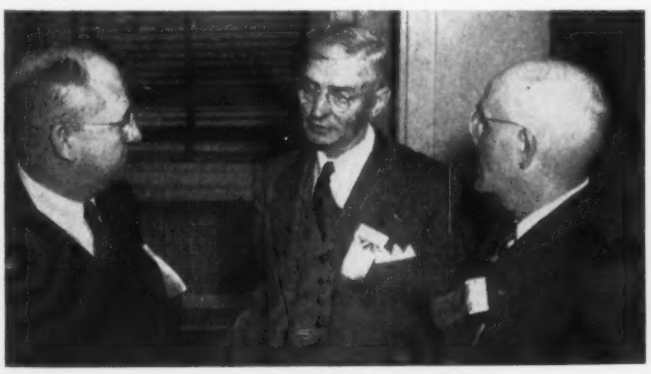
Alger outlined two objectives for the association. First was to clear away the "debris of war, so to speak" in solution of immediate difficulties. Second, in an area where electric power is abundant and inexpensive, he felt that residential wiring would first be affected by the released energies of the public during reconstruction. The National Electrical Code, he said, is based on average conditions and never quite catches up with the rapid increase in residential use in such an area of power availability. Therefore, he called upon inspectors to carry on a constant educational program not only with the public but with the industry to emphasize requirements for safe, convenient installation and to provide for future adequacy.

Gaffney announced that arrangements had been made in Boise to hold the annual meeting of the section there Sept. 23, 24 and 25 and that a local committee was preparing for an unusually fine program.

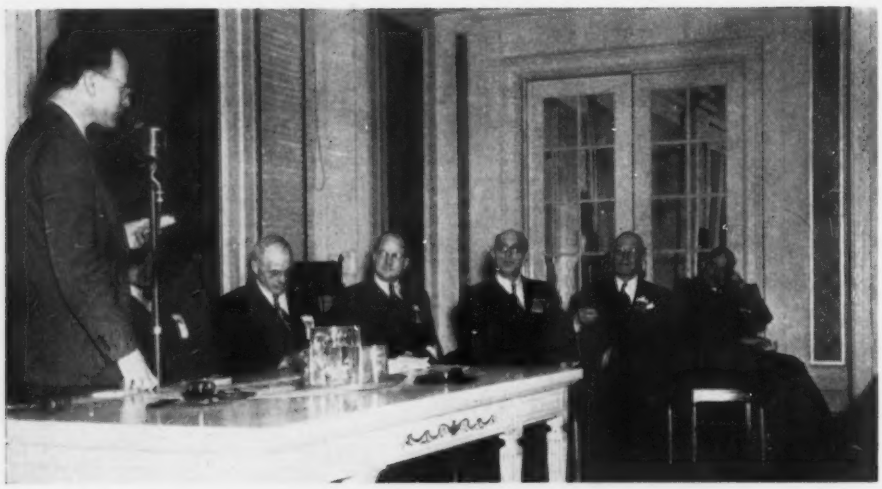
Then speaking personally as an inspector, Gaffney told of the tremendous pressure put on inspectors to accept substitutes during the shortages of regular materials. He said that any expediencies allowed now would find themselves permanent and that the situation would not be improved by allowing questionable substitutions which the inspector could not depend on in case of failures.

Fire Chief J. K. Piercy of Salt Lake City's fire department made an unusually eloquent plea for cooperation between the electrical inspector and all fire chiefs. In fire prevention work, he said, firemen find conditions which they consider hazardous but need the expert opinion of electrical inspectors to back them up. He suggested that, where the fire chief requested, inspectors make rechecks and that they likewise help to educate the firemen to look for proper hazards and to recognize them when they see them. With the critical housing shortage existing in America today, he pointed out, we cannot afford to lose some four million dwellings which are destroyed by fire each year because of carelessness or improper equipment.

In the absence of Fred Benz, United States Rubber Co., San Francisco, Farrell Gunnell of the same company read a paper discussing in detail the new types of wire insulation covered by the 1946 Code. It listed those wires made obsolete, the new code grade, discussed thermoplastic insulated wires and synthetic rubber insulated types, listed the new flexible cord types and solid building wire types which will be permitted in the Code. Although the Code itself will not go into force until November, by general agreement with Underwriters' Laboratories all the wire manufacturers will furnish the new grades



Utahans: Les Johnson, G-E; Secretary D. J. Wolters, Salt Lake City; new chairman Ray Powell, Nephi. Below: Wolters, Gene Fleming and Clarence Grant, new first vice-chairman, all prominent in arrangements for two-day meeting



Bill Cyr quizzes the "experts," Hutchison, (concealed) Peck, Ufer, Johnson, Stayner, Tousley and Wolters, who stole the show. Questions came from the audience

on and after April 1, 1946.

Victor Tousley then presented a review of the changes in the 1946 Electrical Code, which point will be summarized later.

To conclude the afternoon session, a lighter touch was given to the question and answer session when William A. Cyr, associate editor, ELECTRICAL WEST, conducted a quiz program on Code and inspection questions submitted chiefly from the audience. On the board of "experts" were D. J. Wolters, chief electrical inspector, Salt Lake City, Victor H. Tousley, H. G. Ufer, Western superintendent, Underwriters' Laboratories, Los Angeles, J. Hyde Stayner, foreman of the meter department, Utah Power & Light Co., Dan Hutchinson, Graybar Electric Co., Douglas Peck, Peck Electric Co., contractor, Provo, Utah, and Lester Johnson, General Electric Co. Questions ranged from uses permitted for service entrance cable to relay systems for lighting control. One interesting point made by D. J. Wolters was that city authorities in Salt Lake City do not look with favor upon the importation of prewired, prefabricated houses.

In addition to the customary resolutions of thanks passed at the end of the meeting, a resolution was passed urging consideration of monthly meetings at other cities in Utah now that gasoline for travel is again available. Another was passed urging that a committee be appointed to study the possibility of having a state law regarding electrical inspection. A third asked that a committee be set up to prepare papers for presentation at regular chapter meetings.

In the election of officers, Raymond Powell, who had presided over the session as vice-chairman, was elected chairman. Clarence Grant, Utah Power & Light Co., was elected first vice-chairman, Arthur E. Williams, superintendent, Provo municipal electric system, was elected second vice-chairman, and D. J. Wolters was re-elected secretary-treasurer.

The two-day meeting of lighting men and inspectors was brought to a culmination by a dinner Tuesday evening, April 9, sponsored by the Intermountain Electrical Assn., and presided over by its president, O. R. Bigelow, The Paris Co. Elias J. Strong, manager of the association, reported briefly on the association's activities and discussed the Handbook of Residential Wiring Design and the adequate wiring standards which would be adopted for the Utah and Idaho territory.

Elbert Kramer, Pacific Coast supervisor of the Better Homes Department, Westinghouse Electric Corp., from Los Angeles, presented the Westinghouse Disney film, *Dawn of Tomorrow* and the program for publicizing adequate wiring being carried by his company on behalf of the industry generally. Don Lloyd, speaking for the Beautification Committee for Salt Lake City's centennial next year, urged the industry to prepare for that centennial by installation of welcoming signs, illumination of streets and intersections, removal of unsightly utility poles, and cooperation with local groups in lighting up store fronts and generally improving the appearance of the city.

Elbert Kramer, dinner speaker; O. R. Bigelow, Intermountain Elec. Assn. president; P. A. Maughan, V. H. Tousley, at industry dinner winding up conferences

Montana Chapter

The Montana Chapter's customary Friday evening opening session at the demonstration room of Montana Power Co., Great Falls, was largely devoted to the newer forms of lighting. George C. Blend, electrical contractor, Great Falls, chairman of the chapter, presided. William L. Gaffney, secretary-treasurer of the Northwestern Section, Tacoma, as he had in the Salt Lake meeting, reported on the growth of the Northwestern Section, announced the annual meeting at Boise, read the letter from Chairman Alger. He then advocated that Montana consider the need for a state law requiring state inspection and state licensing of contractors. He discussed the experience with such a law in Washington, pointed out how it benefitted the public chiefly and the industry secondarily, and told how the idea first had to be sold to the public before it would get anywhere in a state legislature.

John W. Cromer, lighting engineer, Montana Power Co., Butte, gave a refreshingly simplified and yet thorough review of the essential facts in relation to gaseous tube or cold cathode lighting practice. He discussed both its advantages and disadvantages, advised that maintenance contracts should be sold to customers, explored the brightness problem, predicted that fixture development will someday catch up with the light source development of the present time, and cited the long safety record of this type of illumination.

With charts and diagrams, he illustrated the circuits and their characteristics. Finally, he predicted that this type of lighting was definitely established as a means of interior illumination. He also said that the Fluorescent

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Lighting Assn., was preparing a handbook which would give all the essential factual data required.

The old question of stroposcopic effect was completely put at rest by Dr. E. W. Schilling, dean of engineering, Montana State College of Bozeman. With blackboard diagrams, he explained what stroposcopic effect was, and by means of a cathode ray oscilloscope and photoelectric cell, he showed the relative stroposcopic effect in incandescent and fluorescent lamp light sources. The demonstration showed the blue fluorescent lamp to have the most extreme fluorescopic effect. It showed a 90% ripple where the daylight lamp showed 55%, the 3500° Kelvin white, 35%. Where daylight lamps are used with two-lamp auxiliaries, the ripple is reduced 25%; where white are used in pairs, 16%. A 40-watt incandescent is 13%, whereas a 200-watt incandescent is 5%. The 5% of the 200-watt incandescent can be matched with daylight fluorescent lamps placed on 3-phase circuits, across each phase. From this he concluded that many industrial applications having 3-phase power could have almost flickerless light with such installations.

L. B. Johnson, General Electric Co., Salt Lake City, gave the same talk on maintenance and servicing of fluorescent circuits that he had given at the lighting conference in Salt Lake City. This is reported elsewhere.

The Saturday morning session began with a review of the changes in the National Electrical Code by V. H. Tousley. This was carried on for an hour and a half and then resumed again in the afternoon session after luncheon.

H. G. Ufer, Western superintendent, Underwriters' Laboratories, Los Angeles, talked on developments in electric heating and the problems of safety concerning electric heaters which are the concern of Underwriters' Laboratories. In this respect, he said, the Laboratories ask. "Is it safe for people to use?" and submit the samples brought to it by manufacturers to rigorous tests to determine that safety.

He told how fan type and radiant heaters must be tested with a drape over the grillwork and that, even with the motor blocked, the drape must not burn nor must the circuit wires or motor itself burn. He then asked the inspectors to caution the public never to touch electric heaters in a bathroom when in a bathtub or standing on a wet floor.

Ufer also discussed other Underwriters' requirements for fixtures and suggested that, where inspectors found high temperatures in fluorescent fixtures, they should check to see whether the ballasts may be too close together. If so they may possibly be building up heat due to inductive effect. By turning the ballasts around in relation to each other and moving them farther apart, both noise and heating effect sometimes can be relieved.

The paper by Fred D. Benz, U. S. Rubber Co., San Francisco, was read to the meeting by William A. Cyr, associate editor, ELECTRICAL WEST, who followed that with informal remarks regarding the materials situation, new developments in wiring ideas. He mentioned remote-control, low-voltage system shown in a Los Angeles demonstration house.

Secretary James Clune and Chairman George Blend at Great Falls, Mont.

After the formal program, concluded by Elbert Kramer of Westinghouse and the showing of the Disney film, *The Dawn of Tomorrow*, the remainder of the session was devoted to discussing the proposed state licensing and regulation of wiring. Dan F. Goggans, Goggans & Pennie, electrical contractor-dealers of Great Falls, after talking on the subject, was appointed chairman of a committee to work on such a program. It was suggested that the committee be made up of inspectors, contractors, union representatives, power companies, and that it have committeemen in each county to work with a representative of legislature. The committee is to get copies of other state laws such as those in New Mexico and Washington, and to start a program for such inspection.

At the election of officers, K. L. Chrysler, city engineer, Billings, Mont., was elected chairman; R. R. Grant, city inspector, Havre, Mont., first vice-chairman; A. A. Wells, superintendent of the REA at Fairfield, Mont., second vice-chairman; and James Clune, contractor, Chinook, Mont., secretary-treasurer.

● BEN C. HILL, retiring as superintendent of the Electrical Department for Oakland, was given a special farewell party at the East Bay Electric Club recently. Ralph Yorke, life-long friend and companion of Hill, delivered the eulogy.

Electric Oil

The part electricity plays in the petroleum industry was well told to the Electrical Maintenance Engineers Assn. of Southern California at a recent meeting in Los Angeles. Hal N. Marsh, engineer, General Petroleum Corp., was introduced by E. S. Reichard, chief electrician there, member of the association. He first outlined the industry, saying that the United States was the largest source of petroleum products, Russia second. He then described use of a seismograph to locate oil strata. A small charge is detonated and a record of the length of time for the sound waves to go down to the oil strata and return is made. Another method is to measure the earth's magnetism and gravity, both lessened by strata formations.

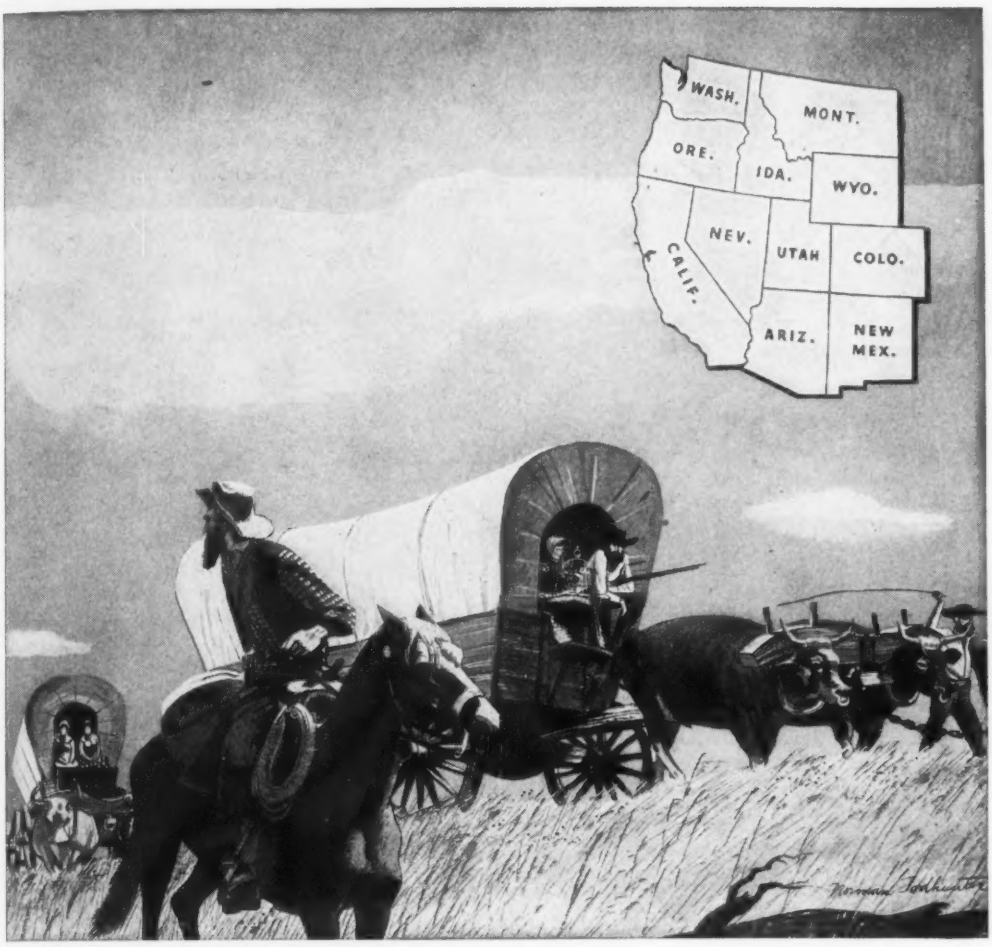
In drilling for oil electricity plays an important part. California, he said, has one of the world's two 16,000-ft. depth wells. Finally he explained the pumping of oil, where in many cases electric motors are used for prime movers; in some cases an electrical centrifical pump is lowered to the bottom of the well, but this has not proved successful. — Henri Ledebour, publicity chairman.

NARC Organized

A new National Association of Refrigeration Contractors was organized in January at a meeting in Cleveland with over 400 firms in six cities as charter members. Among these are associations in Los Angeles, San Francisco, and a new one being organized in Seattle. Of the officers elected, J. F. Park, Western Air & Refrigeration, Inc. of Los Angeles, is the second vice-president, and Lee Shirar of Shirar-Young Refrigeration Corp. of San Francisco, is a director.

Aims of the organization are to study distribution, trade practices, handle labor relations, keeping of equipment in operating condition throughout the country, disposal of government surplus stocks and kindred problems.

● THE COMMERCIAL REFRIGERATION Assn. of San Diego was organized last month, with Elton S. Bailey as president, Ralph French, vice-president, J. H. Gustafson, secretary, and William J. Fickler, treasurer. Directors elected were A. K. Chamberlain, Gordon Scharfenberg and N. E. McDougal. Twenty commercial refrigeration dealers and contractors form the nucleus of the association.



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Below, briefed, a partial roll of FULLER'S part in the growth of the West.

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Engineers, Accountants Exchange Views

Two-day Rocky Mountain Electrical League meeting in Pueblo covers a wide range of timely subjects

FACTS and figures fly when accountants and engineers get together. Yet the human side of the business also injected itself when the Engineering and Accounting divisions of the Rocky Mountain Electrical League held their spring meeting at Pueblo, Colo., April 5 and 6. The two-day session, first in parallel meetings, then in joint session, was broken up by visits to the Colorado Fuel & Iron Corp. plant and to the steam plant and machine accounting departments of Southern Colorado Power Co., host for the affair. Luke R. Storey, president, Home Gas & Electric Co., Greeley, and president of the league, presided at the final joint session Saturday morning. R. Protheroe, Black Hills Light & Power Co., Rapid City, S. Dak. and vice-chairman of the Engineering Division, handled the Friday morning session of that division, in the absence of L. A. Goalby, Westinghouse Electric Corp., Denver. Conrad Jacobson, Mountain States Power Co., Casper, Wyo., both presided over the Accounting Division, of which he is chairman, and presented a paper at the joint session Saturday on functional accounting.

Engineering Topics

Electric furnaces, dielectric and high-frequency heating, electric shovels for the mining industry, a-c welders, and other lately developed electrical equipment, were paraded before the engineers by H. J. Coulson, Westinghouse Electric Corp., Denver. The load characteristics of these new or improved devices, their potentialities in the way of new business, some of the problems encountered in serving them and their revenue possibilities were freely discussed. The audience asked numerous questions and there were comments from various members who had had some experience with some of these equipments.

Murray Graff, General Electric Co., Denver, presented on slides a graphic picture of the relationship of kilowatt-hour use per man-hour in four different groups of industries. The average ratio of kilowatt-hours per man-hour in 1929 in all industries was 2.9. In 1940 it had risen to 5.0 then dropped back to 4.7 in 1943. He felt it should rise again to 5.0 in 1946. To achieve one more kilowatt-hour per man-hour, a 25% better job of load building will be required.

In probing to find where this load could be obtained, he analyzed the four groups of industries. The heavy industries average an 11 to 41 ratio in man-hours to kilowatt-hours; the medium heavy industries, 21 to 27; the food, textile, auto industries, 31 to 21; and the service industries, 37 to 9. He felt that the electrical industry should look more closely into the third and fourth groups for potential increase of kilowatt-hours and reduction in man-hours. He estimated that industry invests $6,000 per man and, as near as he could figure, about $500 per man-hour, and that an investment of about $2,500 per kilowatt-hour is all that is required.

Discussing how best to use a company's existing facilities, O. G. Kirk, Home Gas & Electric Co., Greeley, traced the history of distribution facilities from the time the first electric iron was sold and added to the lighting load. In general, he advocated increasing voltages where possible, and the installation of series capacitors to improve voltage conditions.

In the present era of shortages of both materials and manpower, he said that his company had found it advantageous to let by contract the construction of distribution lines. In subsequent discussion it was also advocated that tree trimming be let out on contract. Contractors for such work, several companies have found, handled the public more diplomatically and were often able to accomplish trimming where customers had previously objected to power companies' men doing it.

F. H. Wiley, superintendent and manager, Colorado Springs Electrical Department, concluded the Friday engineering meeting with an excellent discussion of secondary networks for even small city distribution systems. He outlined the advantages of having either a network or a loop system so that failures at any point would cause less interruption of service to other sections. In Colorado Springs, he said, a start has been made toward an eventual network system by tying the secondaries together wherever possible and banking the transformers. Full text of Wiley's remarks is promised for a later issue.

Engineering topics at the joint session Saturday morning were interlaced with human problems. L. R. Patterson, Public Service Co., of Colorado, discussing *What's Happening to Your Load?* declared that World War I experience was not worth much in predicting loads after World War II. Daylight saving for war purposes had its effect on loads. Reduction of outdoor lighting and such things as the brown-out in early 1945 likewise affected generating demands.

Patterson exposes behavior of loads

Daylight saving had shifted the evening peak an hour later and war production loads had brought an early morning peak. He estimated that about 7 to 7½% of system capacity was saved by war time.

Patterson then compared the load curve of Cheyenne, which had considerable war load, and Grand Junction, which did not. Later, he also showed curves of Denver, with heavy war industries, and of Greeley, which had none. In each case, the cities having no war load showed a drop in maximum demand, but interestingly, after the war ended, their loads picked up and followed the same trend lines that they might have carried on uninterruptedly had the war not affected their loads. The same was true of the trend lines of the cities having war loads.

Load factor, however, has suffered since war time went off. Peaks have been higher and this, he said, has a bearing on investments in generation, lines and substations. This causes the unit energy costs to go up.

Accounting Topics

In *The War Is Over—Your Customer Relations*, F. M. Hendricks, Southern Colorado Power Co., said that the time had come to remove all wartime expedients, such as bi-monthly billing, postcard billing from customers' own attempts at meter reading and that credits, collections and deposits needed to be reviewed and disposed of, if pos-

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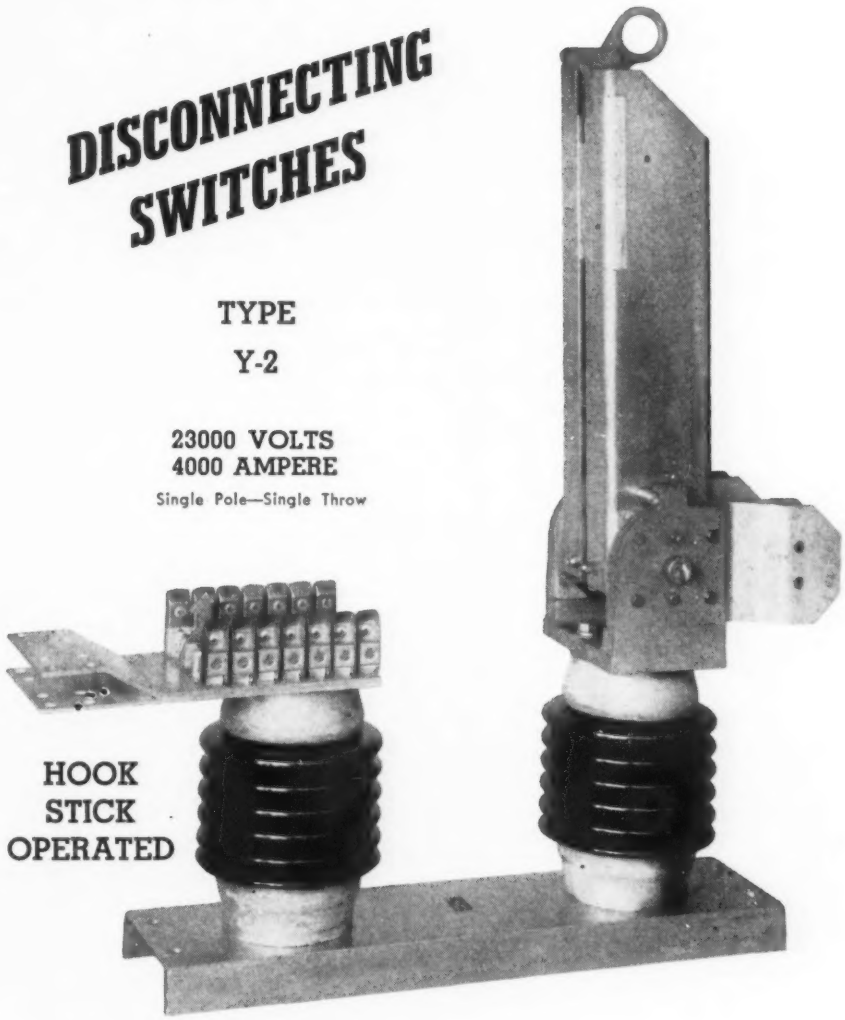

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E. H. Pemberton, Ralph Hubbard, President Luke Storey and H. A. Tiemann, prepare for the Saturday joint session

Hostess and host to the gathering, Mrs. and W. N. Clark, Southern Colorado Power, with Conrad Jacobson of Casper

sible, and policies instituted which would inconvenience the public less and improve service more. In the discussion that followed, the matter of interchanging credit information between companies was talked over.

Taking typical property accounting situations, D. Paul Roberts, Public Service Co. of Colorado, discussed them and made suggestions from his own experience and observation as to handling them. He treated the subject with good humor and brought forth discussion of how others meet such problems. Considerable divergence of opinion came forth as to handling of retirement costs among the various companies.

The human element entered strongly in consideration of various company pension plans. James H. Pitts, Home Gas & Electric Co., Greeley, prior to outlining his own company's recently instituted pension plan, sketched the form of several other plans. Commenting on the need for pension programs, he said:

"The average salaried employee either can not or does not save much money. Maybe that is wrong. Probably he should save much more than he does. But the fact remains that, when retirement day comes, he is no longer able to earn his regular compensation and some provision must be made for him or he is in dire straits. If he has a long service record, his employer feels an obligation to provide for him and either makes him a "pension job" or gives him an outright pension. The pension job is an inefficient makeshift which is bad from an operating point of view and the pension is a burden on the employer which should have been provided for in advance."

Of mutual interest to engineers and accountants was Jacobson's talk at the joint session. Saying that accountants were often accused of trying to make accountants out of field crews, he said that rather they wanted to fit the information supplied them by field service crews into the code of accounts set up by the regulatory bodies. The Federal Power Commission accounts are set up by functions. In order better to fit time and material reports into such a code, he suggested that the field crews make no attempt to decide the code numbers or accounts to which charges be allocated but merely report the functions performed and pertinent data respecting them. The accountants then can better determine which accounts to charge them to.

The employer's obligations in the placement and training of returning veterans was presented quite completely by H. A. Tiemann, Public Service Co. of Colorado. With understanding of the veteran's mental and emotional viewpoints and sympathy for both management, in making the readjustment, and the men, in refitting themselves for civilian tasks, Tiemann covered the essential points of the laws and presented the alternate ways in which the training program could be handled. There are programs worked jointly by the company and the schools and Veterans Administration; those in which the veteran takes additional work in his leisure time; those carried on within the company itself. The latter has the value of giving training by experienced people within the industry. Training is something all progressive companies do anyway to get more efficient personnel, he reminded.

Policy suggested for adoption by all member utilities in respect to a-c welders used by farm customers was prepared by the rural electric committee of RMEL and presented to the meeting by E. A. Dawley, Southern Colorado Power Co. It is simple and reasonable. It requires that all welders carry manufacturers name plate with ratings and have Underwriters' label; states that no additional charge will be made to farm customers whose welder does not exceed 37½ amp. at 230 volts; but those exceeding this may be charged additionally or the higher taps on the transformer may be sealed off to limit the input.

Engineers and accountants were then given a final processing in one of the most important jobs the whole industry has before it, that of promoting more ample wiring capacity. The Westinghouse Disney film, *Dawn of Tomorrow,* was shown at the banquet at Pueblo Country Club, Friday evening. Then T. M. Foulk, Public Service Co. of Colorado, and E. H. Pemberton, Southern Colorado Power Co., at the final session, discussed the need for full cooperation from all in the industry in the promotion of adequate wiring. Foulk, chairman of the RMEL wiring committee, told of the league's program of educational work, with Meryl Mentzer as field representative, to reach contractors, builders, architects and inspectors. Pemberton told what each company could do and showed the literature and sales helps that would be available for such promotion.

Arrangements for the smooth running and concise program had been made by Ralph Hubbard, manager of RMEL. Pemberton headed a local committee which took care of the numerous local details. Attendance exceeded all expectations. Plans to care for about 75 were quickly expanded to accommodate the 128 who registered and jammed the meeting rooms of the Whitman Hotel. Both W. N. Clark, president, and George Milliken, vice-president of Southern Colorado Power Co., as hosts, were active in making sure that the first RMEL meeting in Pueblo since 1926 was a success.

● The Southern California Section of IES started a course in illumination design at John H. Francis Polytechnic School beginning March 4 each Monday evening for a series of 12 weeks. Lecturers are drawn from qualified illuminating engineers in the section. The educational committee sponsoring it is headed by R. J. Crump and has on it Frank Hansen, Ted Shepherd, Allan Palmer, Don Grandey, Rene Martinez.

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Convention Program

Plans set for first postwar gathering

PLANS for what promises to be a convention complete with all of the elements we have missed during the war years are now receiving their finishing touches, according to the chairmen in charge. In addition to planning stimulating meetings with excellent speakers discussing helpful topics, arrangements also are being made to provide entertainment for the members and their wives during the hours between sessions.

The convention will open on Wednesday, June 12, and will close with a dinner-dance the evening of Friday, June 14.

I. W. Borda has been appointed general convention chairman, and Mrs. Borda will have charge of the committee of hostesses. Other chairmen are: George C. Tenney, program; J. A. Hill, stage manager; H. S. Schuler, publicity committee; Paul K. Churchill, reception committee; M. S. Barnes, registration committee; F. H. Searight, hotel committee; W. L. Winter, ladies' entertainment committee; F. E. Bodine, banquet committee; A. Dahl, entertainment committee; G. W. Goodwin, golf committee; J. S. Moulton, transportation committee; H. F. Hartzell, ushers.

Business Development Section

During a meeting held on March 28, the guidance committee of the Business Development Section formulated a day's meeting designed to include subjects dealing with industrial and commercial electrification, as well as subjects dealing with residential problems. Under the chairmanship of H. C. Rice, the committee drafted the following schedule for their meeting on Wednesday, June 12:

Wednesday Morning

The West's New Industrial Horizon —Symposium. Speakers: Don Doub, Pacific Gas and Electric Co., Harold Wright, manager, Los Angeles Chamber of Commerce, and Joseph Ostle, Southern Pacific Railroad.

Bringing the Laundry Out of the Shadows, by Miss Edwina Nolan, director of Bendix Home Laundry Institute.

Electricity in Relation to California Agriculture, by A. J. McFadden, California Farm Bureau Federation.

Wednesday Afternoon

Electric Sales Potentials, by O. R. Doerr, Pacific Gas and Electric Co.

Electrical Living, by A. M. Sweeney, General Electric Co., Bridgeport, Conn.

Commercial and Industrial Lighting, by Harold Green, General Electric Co. Lamp Department, Nela Park, Ohio.

Operating Economics Section

Under the chairmanship of C. E. Baugh, the guidance committee of the Operating Economics Section planned their meetings for Wednesday, June 12, to include the following:

Rotating Voltage Regulators for Synchronous Machinery. Speakers to cover this wide subject will be E. W. Morris, Westinghouse Electric Corp., who will discuss the principles and applications of the Rototrol; W. S. Moody, General Electric Co., who will discuss the principles and application of the Amplidyne; and J. H. Vivian, Southern California Edison Co., who will discuss the results of six months' operation of the Amplidyne as a voltage regulator on a 50,000-kva, synchronous condenser.

Circuit Protection on Long Rural Lines. Speaker to be announced.

Construction of the Third Boulder Circuit, by Jordan Lummis, Southern California Edison Co.

Automatic and Supervisory Operation of Central Station Company Substations. Speakers on this subject will include representatives from California Electric Power Co., Coast Counties Gas and Electric Co., Pacific Gas and Electric Co., San Diego Gas and Electric Co. and Southern California Edison Co.

Report Covering the Activities of the Communications Committee, C. T. Malloy.

Standardization of Street Lighting Fixtures. Speaker to be announced.

Administrative Services Section

The meeting planned by the Administrative Services Section for Wednesday, June 12, will be devoted to a discussion of the suggested revisions of Rules and Regulations as submitted by the California Railroad Commission in its Special Study No. S-125 and No. S-126.

In preparation for the June 12 meeting, delegates from seven electric and gas utilities were invited to attend a meeting in Los Angeles on May 9 and 10. The delegates were rate engineers and men interested in credits, collections, deposits, bills and applications. Previous to the meeting in Los Angeles, the delegates studied their company's own rules and regulations. The meeting in San Francisco promises to be a fruitful one for persons interested in these matters.

General Convention

Speakers for the Thursday, June 13, morning meeting of the convention will be: Ralph Carr, former Governor of Colorado; J. J. Deuel, California Farm Bureau Federation, whose topic will be *Central Valley Project;* Myrtle Fahsbender, Westinghouse Electric Corp., Lamp Division, who will discuss *Home Lighting.* Prof. Frederic P. Woellner, University of California at Los Angeles, will be the luncheon speaker.

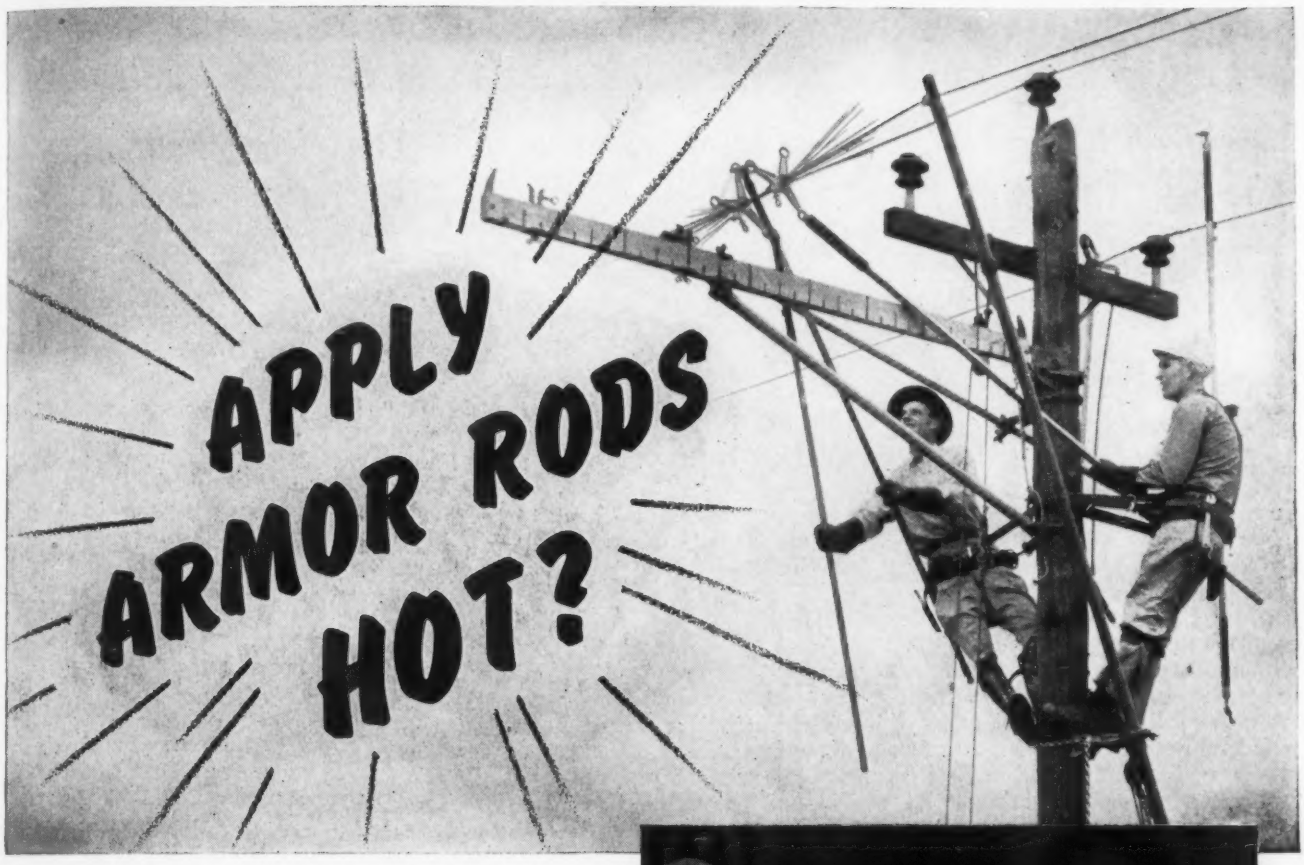
The following will speak during the afternoon session: Leonard Read, National Industrial Conference Board, an atomic scientist; H. Vernon Scott, vice-president, National Tax Equity Assn.; Walker L. Cisler, manager, production department, Detroit Edison.

During the Friday, June 14, morning session, speakers will be: R. J. Cordiner, vice-president, General Electric Co.; Dean J. Hugh Jackson, Stanford School of Business Administration.

The convention will conduct the association's formal business during the Friday morning session and will adjourn to the golf course for the afternoon session on the links. Following the golf tournament, a dinner-dance (prewar style) will bring the association's first postwar convention to a close.

San Francisco's Fairmont Hotel has been selected as convention headquarters, with the Mark Hopkins chosen for some overflow events. Members have been mailed formal programs and reservation forms. Due to the large attendance expected, persons planning to take part in this convention are urged to make their reservations at the earliest possible moment. Hotel accommodation conditions probably will make it necessary for convention delegates to share the rooms available.

● L. E. WORMLEY, Veterans Administration, addressed the San Francisco Electrical Contractors Assn. at its March 28 regular meeting, discussing veterans training. The San Francisco association and Local No. 6 IBEW have set up an apprenticeship training program specifically to train veterans needed as electricians in the construction industry.



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The application is simple. Dies are inserted in holder frames and armor rods are threaded through dies. The illustration at lower right shows assembled unit ready to be placed over the conductor. After being placed on the line, the eye screws are turned up with clamp sticks to close the die. The newly-designed die holder frames, which eliminate the need of special hooks or tools, are turned with ordinary disconnect sticks, one clockwise and the other counter-clockwise, until center of span is twisted. Holder frames are then moved to the ends of the span and the twisting is continued until job is completed, after which frames are removed from line. Clips are applied by a special device designed to hold armor rod clamps, and nuts are cinched with a hot line wrench.

The die holder frames are made of heat-treated cast aluminum for combined lightness and strength. They fit all Aluminum Company of America dies for C size wrench frames.

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COUNTY COURT RULES PUD PURCHASE LEGAL

Plan of 15 Washington PUDs to purchase Puget Sound Power & Light Co. (EWEST, April, p. 108) was declared legal by Skagit County Superior Court Judge W. L. Brickey within a few hours after final argument by the intervenors, Weyerhaeuser Timber Co., the state attorney-general and city of Seattle.

W. E. Heidinger, attorney for Weyerhaeuser, recalled that Puget Power's Seattle franchise expires in 1952 and questioned whether, in the event those operations were eliminated from the proposed PUD program, the reduced revenue would be sufficient to pay off the bonds. He also pointed out that the company's Rock Island Dam operates under FPC license and asked if the federal license could be transferred.

Referendum 25, defeated in 1944 by Washington voters, was brought into the case in final arguments. The bill would have created joint PUD commissions and the intervenors maintained that, in view of its defeat, there is grave question as to whether the Grange Power Act of 1930 grants the authority necessary to the PUD proposal. Under the plan Skagit County PUD would buy the entire system and later sell it to the others.

San Diego G & E, Irrigation District Sign Agreement

San Diego Gas & Electric Co. and the Imperial Irrigation District have signed a 25-year agreement regarding limitation of power service in certain areas of San Diego and Imperial counties, according to announcement by California's Railroad Commission. Under the contract terms, San Diego Gas & Electric is restricted to sale or distribution of power west of a line cutting off the southwestern portion of San Diego County. The irrigation district is confined to sale of power for use in the northeastern part of San Diego County, and in all of Imperial County, extending south to the Mexican border.

The agreement stemmed from the recent purchase by San Diego Gas & Electric of a part of a transmission line from Rincon to El Centro, owned by the irrigation district. The line had been acquired from California Electric Power Co. in 1943, and basis for the new contract existed in a like limitation of service agreement between the district and California Electric Power.

Arrangements were approved in the agreement by which the San Diego company and the district will maintain their portions of the continuous Rincon-El Centro line. Also they will provide each other with stand-by and emergency service as needed until Nov. 1, 1947, at a charge of cost plus 15%.

Companies Ask Rate Increase Matching Oil Price Raises

Increase in industrial rates to offset the recent OPA advance in fuel oil prices has been requested by three California power companies.

Pacific Gas and Electric Co. has applied to the California Railroad Commission for permission to raise its rates on industrial electricity, as covered by escalator clauses in contracts or tariff schedules, to meet the March 20 OPA raise of 15 cents a barrel on fuel oil. The raise, according to PG and E estimates, would increase company costs at least $380,000 annually.

Southern California Edison Co. has also filed application for rate increase on the same escalator clause basis with the railroad commission, and it was reported that San Diego Gas & Electric Co. would seek a like power rate rise.

Predictions were that an OPA protest will be registered against the increase within 30 days, following which hearings on the matter would be set by the commission. A similar procedure was carried out in 1943, when utilities sought to up rates to match the 25-cent OPA raise on fuel oil prices, and in which the railroad commission supported them. In this instance, as in the one three years ago, OPA will lack power to prevent the rate advance if the commission authorizes the raise.

Utah Power Co., Provo Sign Interchange Pact

A five-year power interchange put into effect last month between Utah Power & Light Co. and the city of Provo, Utah, provides that the city may take stand-by power up to a peak of 2,000 kw., with a minimum of 250,000 kwh. at the rate of two cents per kwh., amounting to $5,000 annually. In return, the Provo plant will sell surplus power to the company at five mills per kwh. To handle the new load, a connection has been made through a temporary substation; meanwhile, a new substation is nearing completion at the Olmsted plant.

CONSTRUCTION BIDS ARE CALLED ON GRANBY DAM

Bids for the construction of Granby Dam, one of the key units of the Colorado-Big Thompson project, were to be opened April 26 by the Bureau of Reclamation at Denver.

The dam, to be constructed five miles northeast of Granby on the Colorado River, will store 482,000 acre-ft. of water for irrigation and power development. The principal features involved in the construction are an earth dam across the Colorado River, an outlet works through the left abutment of the dam, an open-channel spillway and an earth-fill dike.

Granby Dam will have a maximum height of about 230 ft. above the river bed, a crest length of about 880 ft. and will contain approximately 3½ million cubic yards of earth and rock. A concrete-lined, open-channel spillway will be constructed in rock at the left abutment of the dam with a concrete gate structure at the crest of the dam. The outlet tunnel was driven through the left abutment of the dam in 1942.

Water stored in Granby reservoir will be pumped into Shadow Mountain reservoir, an extension of Grand Lake formed by Shadow Mountain Dam, and will pass into the 13-mile-long Alva B. Adams Tunnel, through the Continental Divide. Placing of concrete lining in the tunnel was completed in February of this year.

PG and E to Release Sacramento System

Ending 12 years of litigation, a contract signed last month by Pacific Gas and Electric Co. and the Sacramento Utility District provides for release to the district on Dec. 31, 1946, of company properties in the 650-sq. mi. area.

The $11,632,000 price set by the California Railroad Commission in 1938 is agreed to in the contract, with adjustments for additional investments and depreciation to the date of transfer. Under the agreement, the district will purchase its power requirements from the company until June 30, 1954. Power rate is estimated to average 5.8 mills per kwh.

● NEW MEXICO Public Service Commission has approved rate reductions totaling about $6,050 annually for customers of the Pecos Valley division of the Southwestern Public Service Co.

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LANE COUNTY CO-OP NOW TAKING BONNEVILLE POWER

Delivery of Columbia River power to the Lane County Electric Cooperative in western Oregon began on March 30, under terms of a 20-year contract with Bonneville Power Administration. The agreement will provide an additional 6,000 kw. in the Lane County and Drain areas.

Transmission of power is over a 29-mi. section of a 33,000-volt line owned by the Douglas Electric Cooperative, from the Bonneville substation at Eugene to Cottage Grove. When the line from Cottage Grove to Drain is completed, Bonneville will serve directly the Douglas co-op and the city of Drain, which now receive power by transfer over California Oregon Power Co. facilities. It was announced that Bonneville will lease or purchase the Eugene-Drain line.

Other provisions of the Bonneville contract with the Lane County co-op include delivery of power to Fox Hollow, where a substation is being built, and in the Creswell vicinity.

Audit to Show Status of Eastern Oregon Properties

Union County, (Ore.) PUD, California-Pacific Utilities and Bonneville Administration have started an audit of Eastern Oregon Light & Power Co. holdings.

It was indicated the audit was to determine what part of the Eastern Oregon properties, revenues and expenses are assignable to the PUD.

California-Pacific Utilities, holder of sales contract for purchase of Eastern Oregon Light & Power, last month was still awaiting approval on its financing plan by Oregon and California state utilities commissions. Previously a strong opponent to the transaction, the Union County PUD began negotiations last month for partial purchase of Eastern Oregon properties.

● CITIZENS of Courtenay on Vancouver Island are confronted with a problem, as a result of the development of the B. C. Power Commission's program on Vancouver Island. At present the City of Courtenay operates its own electric utility, purchasing the 25-cycle power from the Canadian Collieries (Dunsmuir) Ltd., the power being developed by the company at its Puntledge River plant. When the B. C. Power Commission's development at Elk Falls is completed, 60-cycle power will be available and the change will affect every user of electrical appliances and involve rewinding and replacing of all electric motors and appliances.

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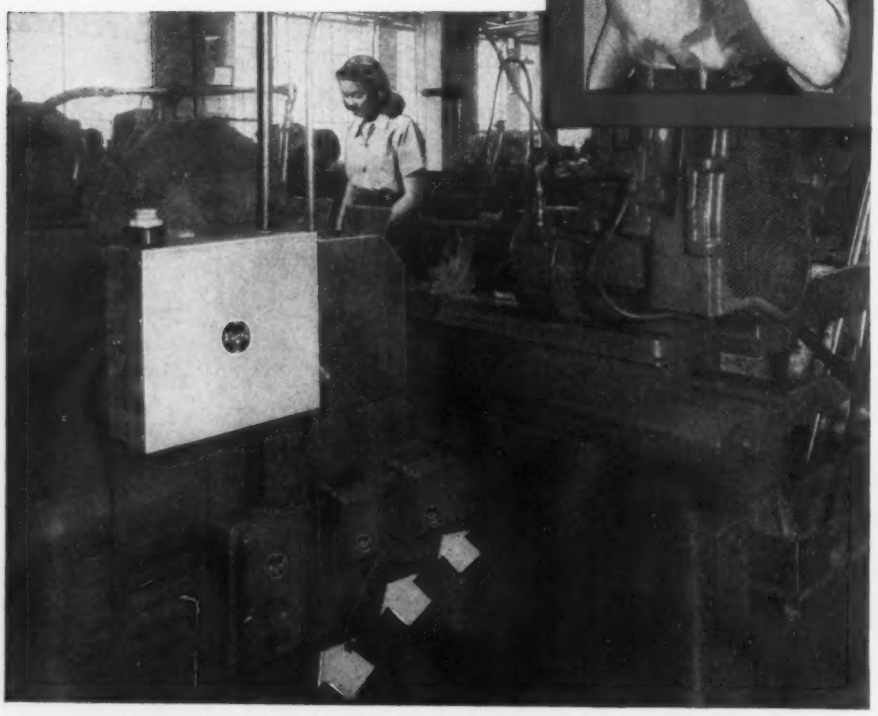

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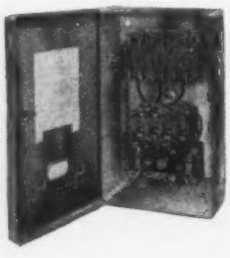

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MOUNTAIN STATES LINEMEN GO OUT ON BRIEF STRIKE

Mountain States Power Co. linemen in the Coos Bay and Coquille areas went on a two-day strike last month, following a breakdown of wage negotiations between the company and members of the CIO Utilities Workers Organizing Committee.

The workers asked originally for a flat 20-cent-an-hour increase. The company made a final offer of 15 cents, said to represent a total increase of 38% since March 1, 1941. When a company offer to arbitrate was rejected by the union, the U. S. Conciliation Service entered the dispute and negotiated a 17-cent-an-hour over-all increase.

The Coos Bay power plant was not affected by the strike, since its workers belong to a different union, but office employees respected a picket line in front of the company's district office.

A number of business houses and homes were without electricity for a night and day, when a transformer fuse burned out and was not replaced until the strike ended.

PG and E Raises Wage Rate, Negotiations Continue

Pacific Gas and Electric Co. last month raised its wage rates 2½%, consistent with an increase recently granted by Southern California Edison Co.

This introduced a new issue into wage negotiations between PG and E and CIO unions, which had threatened to strike, the unions declaring company announcement of the increase to be a breach of agreement. Negotiations were still going on as this issue went to press.

● URGING more and higher-paid electrical inspectors in Seattle, William Gaunt, business agent of IBEW Local B-46, in a letter to the city council criticized the Civil Service Commission for not having examinations for electrical inspectors' positions. He said lack of personnel has placed the city building department "thousands of permits" behind in making inspections, and is holding up new construction. Gaunt also asked for stringent penalties for persons assaulting inspectors on duty, and quoted a recent case in which an inspector was attacked, and the assailant fined only $25.

● A CONTRACT has been awarded to Charles J. Dorfman of Los Angeles for street and highway construction for the Davis Dam government construction camp near Kingman, Ariz. The contract is for $214,251.

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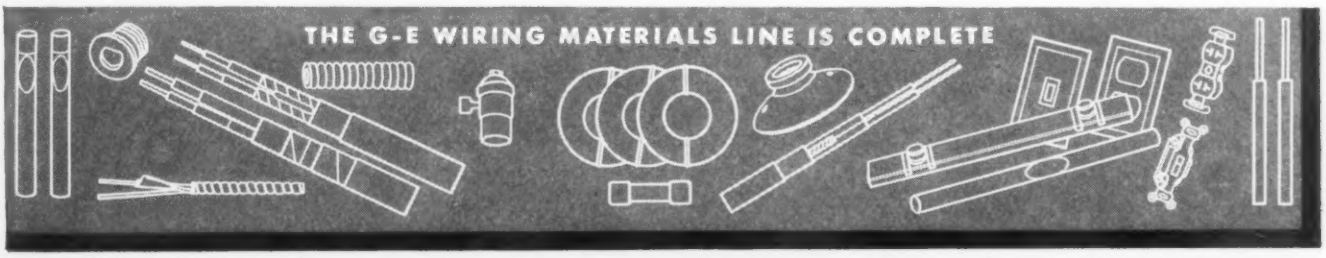

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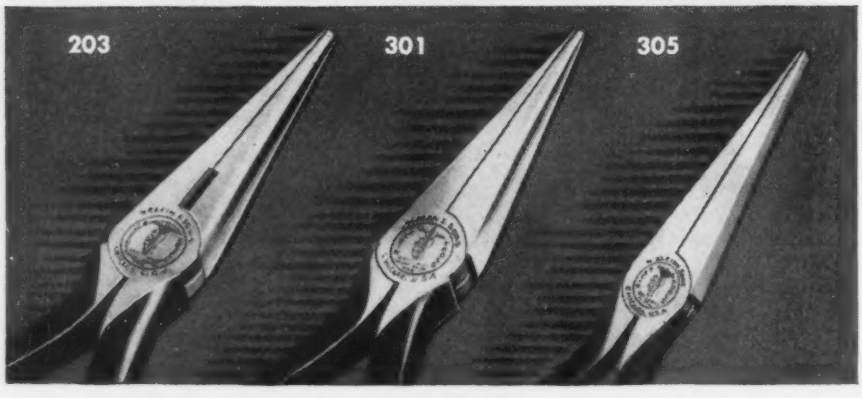


WORK TO BE RESUMED ON ANDERSON DAM MACHINES

Manufacture of two 13,500-kw. hydroelectric generators for the power house at Anderson Ranch Dam of the Boise project will soon be resumed, according to the Bureau of Reclamation.

Contracts for the generators were awarded in 1942 to the Westinghouse Electric Corp. and for the turbines to James Leffel Co., but work of assembly was halted by the war. The 86-by-66-ft. power house, which ultimately will house three 13,500-kw. units, is scheduled for completion in the summer of 1948.

Other power phases of the Boise project include surveys that are to begin shortly for a 138-kv. transmission line between Anderson Ranch Dam and Mountain Home, Idaho, to furnish irrigation pumping power to the Boise, Boise-Payette, and Owyhee projects. Power is to be transmitted from Mountain Home to these projects later by bureau transmission lines.

Anderson Ranch Dam is a multiple-purpose project designed for generation of electric power and provision of supplemental water for 320,000 acres in the Boise Valley area.

Utah Power to Rebuild Line on Idaho System

Reconstruction of eight-tenths of a mile of 11-ft. wood stave flowline pipe serving the Grace, Idaho, power plant of the Utah Power & Light Co. will begin in May. Estimated cost is $235,000.

Originally built in 1913, the line extends from the Grace Dam about 4½ miles to a large surge tank atop a hill, from where the water plunges 524 ft. into the Grace generating station. Approximately 2,000 ft. of the old line were rebuilt in 1937 and another 5,000-ft. section was rebuilt in 1939. The flowline has a capacity of 1,020 sec-ft. or 450,000 g.p.m.

The job must be completed within the month inasmuch as three 11,000-kw. generating units will be out of service while the work is in progress, according to J. L. Jameson, who is in charge of the construction for the company.

● GENERAL ELECTRIC has been awarded a $221,194 contract to supply switchgear for the Shasta and Keswick power plants of California's Central Valley project. G-E is now manufacturing three 25,000-kw. turbo-generators for the Shasta plant, which, with the remaining three 75,000-kw. Shasta turbines, are scheduled for 1947 operation.

HOUSING CAN COST TOO MUCH

EVERYONE in the United States wants our people, and particularly our war veterans, well housed quickly. Almost everyone, we believe, likes the vigor and imagination with which Wilson W. Wyatt, the housing expediter, is going about the job of mobilizing our housing resources.

No one, however, wants the veterans, or anyone else, to get a lot of severe economic headaches along with the housing. As it stands, the emergency housing program runs unnecessary risks of having such results.

Here are the reasons:

1. The principal opportunity the program offers to the veteran is that of buying a high-cost house where a chance to rent would, more often than not, meet his needs much better.

2. At the worst possible time, the program adds substantially to the dangers of a runaway inflation of the sort that inevitably ends in a crash.

3. Little is done to try to reduce the arbitrarily high costs of building, such as those resulting from restrictions imposed by labor unions and antiquated building codes.

4. By giving overriding priorities to unattainable goals of home construction, the program endangers a volume of industrial construction necessary to sustain full employment.

Needs of Veterans

First on the needs of the veterans. What many, if not most, veterans need is a chance to rent a place at a reasonable rental while they are getting shaken down in their postwar careers which in many cases are inevitably unsettled at this time. Essentially, what the "Veterans Emergency Housing Program" gives them is a chance to buy, for about $6,000, a house built along conventional lines and padded with much unnecessary labor and material cost.

But what are the alternatives? There are at least two. One is to put far more emphasis on more effective use of existing housing than the Wyatt program has thus far. The other is to see that the proportion of new rental units is much stepped up.

Incredible as it may seem, there are at present more than 2,000,000 vacant dwellings in the United States. Many of them should be demolished. But many permit of relatively satisfactory temporary use. Many more single dwellings can readily be converted into comfortable multiple dwellings. The emergency program assumes that only 350,000 dwelling units can be provided this year by these expedients, but it does not seem unreasonable to assume that this figure might be doubled by a vigorous drive. The result would be a better balanced emergency housing program, because it would provide more rental housing immediately and save critical building materials.

Of the new housing units contemplated by the Wyatt program, it is estimated that only about 20 per cent will be for rent. Before the war more than half of the homes in the United States were rented. That means that unless the Wyatt program is to create little less than a revolution in the terms on which homes are occupied, it must be revised to include a much higher proportion of rental units.

To secure the result in the face of present high building costs special inducements will be required. They might be provided by allowing accelerated tax amortization of, say, half the construction cost over the next five years, together with rent ceilings high enough to make this form of investment attractive. This would, of course, call for higher rents, but the actual price to the veteran, in woe as well as money, might well be much less in the long run than if he bought an over-priced house now.

Too Easy To Pay Too Much

One of the mysteries of the Wyatt program is its general emphasis on measures to increase the supply of money with which to buy houses when the demand for houses is already at an all-time high. Some veterans may need special financial help, but the plan to give 90-95 per cent mortgages generally on new homes is not only unnecessary but positively dangerous. By providing up to $3.5 billions of government-guaranteed credit for homes this year, and almost twice as much in 1947, the program will release an equivalent amount of individual savings to create further demand for goods and services. All that such generous mortgage terms will accomplish with certainty is a dangerous lengthening of the odds that we will not avoid a boom and bust cycle of inflation.

If building codes were brought up to date and arbitrary union working restrictions were eliminated, the way would be paved for reductions in the price of standard houses which, it has been estimated, might run as much as 20 per cent. This would both give the buyer of a new house a far better run for his money, and also reduce the inflationary pressure created by the super-generous credit arrangements involved.

Getting anything done along this line is difficult, particularly because the restrictions are imposed by tens of thousands of separate localities and organizations. Some headway is being made. The local emergency housing committees being set up under the Wyatt program provide a means of doing much more. Far more steam must be put behind this aspect of the program, however, if its greatest potentiality for permanently constructive accomplishment is to be realized.

Crippling Essential Industrial Production

The goals set for emergency housing construction —1,200,000 new homes started this year and 1,500,000 started in 1947—are higher than any qualified authority thinks can be met without crippling other essential construction. The reasons commonly assigned for such optimistic goals is that they are inspiring to those in the industry and soothing to those who want something tremendous done about housing.

Under normal circumstances, relatively little damage might be done by such excessive goals which are a common feature of most Washington programs trying to elbow their way to the center of the national stage. However, the emergency housing program carries with it top priorities for the materials to be used. Consequently, other essential construction will have to get along on whatever share of critical building materials will be left after all demands of home builders have been satisfied.

The Civilian Production Administration estimates that output of important materials will fall far short of needs. It forecasts a 15 per cent deficit in lumber, 18 per cent in bricks, and 52 per cent in cast iron radiators. Hence, unless building materials output can be stepped up far more rapidly than now seems possible, a prohibitive squeeze will be put on industrial building to provide the materials needed for the Wyatt program. This would complicate unbearably the problems of sustaining full employment and getting the flow of production so important in avoiding the boom and bust route.

Perspective on the Housing Shortage

What is needed is an aggressive drive to get full production of building materials as rapidly as possible. Such a drive should concentrate on measures aimed at helping the industry remove the obstacles to all-out production rather than on such measures as the subsidy plan which seems quite likely to succeed only in enmeshing the industry in more government controls. After making due allowance for the materials outlook and the needs for essential non-housing construction, housing goals should then be set as high as feasible. As matters stand, by setting construction goals before feasible material goals are determined, the cart is put before the horse.

There can be no doubt about the acuteness of the housing shortage and the necessity of a program commensurate with the magnitude of the problem. It also remains true, however, that the housing shortage for the nation as a whole is not quite as desperate as those who want the country to drop everything and go to building houses would have us believe.

During the war 3½ to 4 million new dwelling units were built or created by remodelling in other than farm areas. The number of families living in such areas increased by less than 3½ million. Even though some of this housing was located in remote places as an adjunct of war production works, the wartime increase permitted a margin for more housing per family at this time. Indeed, it has been estimated that the rate of doubling up is only about one-third as great as in 1940. The margin did not begin to suffice, however, to meet the needs of those millions of people particularly in the lower income groups who, thanks to rapid increases in income, can afford to have and insist upon having better housing than they have ever had before.

A rising standard of income which makes possible a new standard of housing for many people is a fine thing. Above all, it is important to see the veterans get the best possible break in housing.

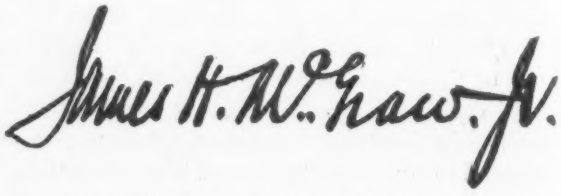
But Housing Can Cost Too Much

The Wyatt program has many good features. The emphasis on prefabrication, though perhaps overoptimistic, is hopefully modern. The emphasis on local collaboration in solving housing problems which are inevitably in large part local should lead to permanently valuable results. The vigorous mobilizing of 300,000 temporary dwellings to meet at high speed some of the most desperate shortage is all to the good.

The main trouble with the program is that it does not pay enough attention to the economic havoc which may be created in the process of trying to meet its excessive goals. As a nation, we should be and are willing to pay a high price to get adequate housing. But the price will be too high if we:

1. Give the veteran a bad bargain by selling him an over-priced house.
2. Cripple industrial production needed to create good jobs for veterans, and
3. Touch off a disastrous inflationary sequence in the process.

These pitfalls can be avoided. All of us, including the veterans, have a common interest in seeing that they are avoided.



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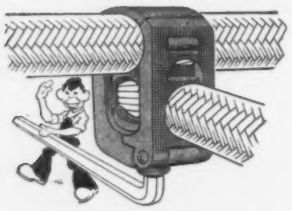
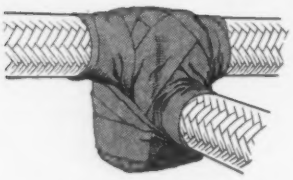


EASY TO TAP



EASY TO TAPE

The sureness—electrical and mechanical—of this T&B Lock-Tite* Tee Parallel Tap** is confirmed by Approval of the Underwriters Laboratories, and contractors everywhere.

Electricians on the job are sure of it because it is solderless and easy to install in one operation with a key wrench. Also because it is streamlined for easy, compact taping.

Made in all sizes to tap mains 1/0 to 1,000,000 CM to all branches #2 to 1,000,000 CM in all possible combinations. Lock-Tite Connectors are economical to stock since each fitting takes several overlapping sizes of any kind of cable. 100% salvageable.

Distributed solely through the service organizations of T&B Electrical Supply Wholesalers.

Another sure thing:
They are available now.

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2207 First Ave., S.
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**Patented

THE THOMAS & BETTS CO.
INCORPORATED
manufacturers of electrical fittings since 1898
ELIZABETH, 1, NEW JERSEY
In Canada: Thomas & Betts Ltd., Montreal

ALUMINUM PLANTS ADD LOAD TO BONNEVILLE SYSTEM

Lease of the government's aluminum plant at Troutdale, Ore., to the Reynolds Metal Co., announced at Washington, D. C., is based on immediate use of four potlines and the company has agreed to operate those lines continuously during the first two years of the five-year lease, according to Dr. Paul Raver, administrator of the Bonneville Power Administration.

Dr. Raver also announced that the Kaiser Co., which has leased the Spokane aluminum plant, plans to open four potlines immediately, instead of the two specified on his lease.

Opening of the two plants means an addition load of 280,000 kw. on Bonneville lines.

● J. H. BAXTER and Co., San Francisco, has been awarded a $73,548 contract for delivery of 1,140 poles for construction of a 55-mile, 115-kv. transmission line from Alamogordo to Hollywood, N. M. The line is a portion of a 120-mile circuit from Las Cruces to Hollywood, and connects with a 63-mile line from the Reclamation Bureau's Elephant Butte Dam to Las Cruces. Later this year Reclamation plans to construct a 50-mile, 115-kv. line from Elephant Butte to Albuquerque.

● ALLIS-CHALMERS and Westinghouse have been awarded contracts for transformers and circuit breakers for the Parker Dam Power project. Allis-Chalmers was awarded a $356,359 contract for three 30,000-kva. transformers. Westinghouse got a $93,539 contract for three oil circuit breakers, one 230-kva. unit, the others 161-kva. They are rated at 800 amp. with an interrupting capacity of 2.5 million kva.

● PLANS for the development of hydroelectric resources in the Arrow Lakes district are now being considered by the B. C. Power Commission, according to Capt. C. S. Leary of Nakusp, former M.L.A. for the Kaslo-Slocan area. Leary recently spent some time in Victoria interviewing the power commission and stated the commission planned the erection of a dam and two-mile tunnel at What Cham Lake to develop 4,000 hp.

● SURVEYING for the 350-mile extension of power lines of the Clearwater Valley Light & Power Assn., Lewiston, Idaho, was begun April 8, A. R. Mushlitz, project manager, announced. The new lines will serve districts in the Pierce, Headquarters, and north fork of the Clearwater River sections, while other lines in the area will be restrung to increase power capacity.

JEFFRIES

TRANSFORMERS

BUILT TO ORDER IN A HURRY!!

When you are installing or re-arranging—and need a special transformer to exactly match your requirements—call on us. We can deliver in a week to 10 days.

Specify scattered transformers to eliminate duplicate conduit runs and save on power costs.

JEFFRIES TRANSFORMER COMPANY
1710 E. 57th St. Los Angeles 11, Calif.

GET ACQUAINTED WITH "STATES" TESTING EQUIPMENT

PORTABLE PHANTOM LOADS
Used in electric Meter testing.

TYPE "SJ" AND TYPE "T" TEST BLOCKS
Facilitate the testing and changing of Meters and Relays.

TYPE "NA" TEST BLOCKS
Simplify testing and installing Watthour Meters.

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Provide compact terminal facilities, and simplify testing or disconnecting switchboards, signal and similar circuits.

TEST TABLES simplify the testing of Watthour Meters, Indicating Instruments, Relays and Transformers.

TIME SWITCHES used with Electric Signs, Street Lighting Systems, Lighting Railroad Yards, Window Displays, etc.

RELAY TESTING APPARATUS, Test Switches, Relay Loads, Cycle Counters.

Some Type "SJ" and "T" Test Blocks Carried in San Francisco Stock

SEND US YOUR INQUIRIES

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420 Market St. San Francisco, Calif.
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NOW AVAILABLE!

GOVERNMENT SURPLUS

METALS

FOR IMMEDIATE DELIVERY

THE Western Regional offices of the War Assets Administration have joined together in a cooperative sales offering of ferrous and non-ferrous metals. If items you seek are not listed, you may be able to obtain them through the nearest War Assets Administration office.

COPPER TUBING

Hard or soft drawn seamless, in coils or various straight lengths (crated). Various diameters and thicknesses.

ALUMINUM

Sheets and tubing in various sizes, thicknesses and specifications (San Francisco). Bars, rods, tubing and extrusions, (Los Angeles).

BRASS

Brass pipe, Grade A seamless in 12 to 16 foot random lengths ½" to 5" diameters.

PIPE

Small inventories of: cast iron and steel pipe in various sizes; fittings including reduction couplings, tees and elbows; well casing; lap-weld and galvanized pipe; and steel tubing.

VALVES

A broad range of valves in various sizes and materials including wedge gate, swing, check, float, globe and plug, with wheel, wrench or hydraulic control.

CABLE - WIRE ROPE

Choice selection of cable in various sizes (with hemp or fibre core) including guy-wire type galvanized or tinned. Also heavier cables with serration, suitable for bonding, guying, guard rails, etc.

LEAD BASE ALLOYS

Limited inventories of babbitt and solder. Determine availability through nearest W.A.A. office.

STEEL

PLATES

Sheared or milled plates in wide range of sizes carried in most W.A.A. western inventories.

SHEETS

Limited supply in scattered locations (broken lines). Hot rolled alloy sheets (SAE 9130) from 7 to 14 ga. varied widths from 29" to 70" and lengths from 86" to 168", available from San Francisco inventory.

BAR

Good supply carbon square, and octagon in varying lengths and diameters.

Production bars, round mild steel in 20 foot lengths, available at Spokane or apply to nearest agency.

STRIP

Varying thicknesses and widths (in rolls and flat).

STRUCTURALS

Broad inventory in various dimensions and specifications.

MILL STOCK

Various sizes and analyses, available at Salt Lake City.

WAR ASSETS ADMINISTRATION

Items offered subject to prior sale or withdrawal. Buying preference to Veterans of World War II.

WESTERN OFFICES: Boston Building, DENVER, Alpine 0415 • Power Block, HELENA, Phone 481 • 215 West 5th St., LOS ANGELES, Michigan 6321 • Pittock Block, PORTLAND, ATwater 6401 • Dooly Bldg., SALT LAKE CITY, 5-7503 • Dexter Horton Bldg., SEATTLE, Main 1080 • Columbia Bldg., SPOKANE, Main 5111

262

"We'll make money with Paragon INTERVAL TIMERS"

. . . because they're semi-automatic . . . synchronous motor operated . . . accurate in controlling the time intervals of hundreds of operations. For example, when preset they will turn on a fan . . . permit it to run for a predetermined time . . . then turn if off. The running time may be readily varied for each successive operation. Other applications are: plastic molding, batch mixing, heat treating, liquid agitation, light exposure, pump operation, watchman signals, food cooking, etc.

Paragon Interval Timers are rugged, durable, not affected by vibration or changes in temperature. Available in 8 different time ranges. The 2900 series (illustrated) is for wall mounting; 2400 series for flush panel mounting. Telechron Motored . . . completely self oiling and sealed against dirt. Reasonably priced . . . write for details on this and other Paragon time controls.

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"Mr. Tops," The Paragon Symbol of Top Quality

Paragon
Two Rivers, Wis.
BUILDERS OF ELECTRICAL EQUIPMENT SINCE 1905

MATTHEWS AWARDS AGAIN OFFERED TO INDUSTRY

The Claude L. Matthews Valor Awards, suspended during the war, will again be offered annually for outstanding acts of courage and devotion to duty by employees of electric companies. The awards have been broadened to include employees of both publicly and privately owned utilities in the United States.

Three cash awards of $150 each are given annually and are accompanied by a citation and lapel emblem. The award may be made to a group as well as to an individual.

The awards are administered by the Edison Electric Institute and selection is by a group of judges appointed by the EEI Prize Awards Committee. For acts occurring during 1946, recommendations for the award must be sent to the secretary of the EEI not later than April 1, 1947. Recommendations must be made by chief executives and none will be accepted for deeds prior to 1946. Factors given weight in the judging are importance of the service affected, the courage, good judgment and quick action and devotion to duty displayed.

● SAN FRANCISCO Utilities Commission will divide its five-man board by naming each member to specialize in one phase of the city's utilities, which constitute a $225,000,000 investment. Under the new plan, one commissioner will be assigned to handle the bureau of heat, light and power, one to Hetch Hetchy water and power, and another to Municipal Railway operations.

● SHOPS of the city owned and operated electrical distribution system of Roseville, Calif., will make repairs on electric stoves, water heaters, toasters and other appliances as a result of an ordinance passed in April by the city council. The repair service will be given without charge except for the cost of materials and an additional 10% handling charge.

● SHORTAGES of materials have forced the Colton, Calif., municipal light department to postpone preliminaries to its announced changeover from 50 to 60 cycles. The Colton department is supplied by Southern California Edison Co., which plans the switchover for this year.

● SEATTLE CITY LIGHT recently awarded a $589,093 contract to General Electric Co. for equipment for 17 substations to be installed in Seattle residential areas. The new stations will constitute a part of the $1,100,000 expansion program announced earlier by City Light.

HELWIG SPEER
Carbon Products

BRUSH KITS OF ALL DESCRIPTIONS
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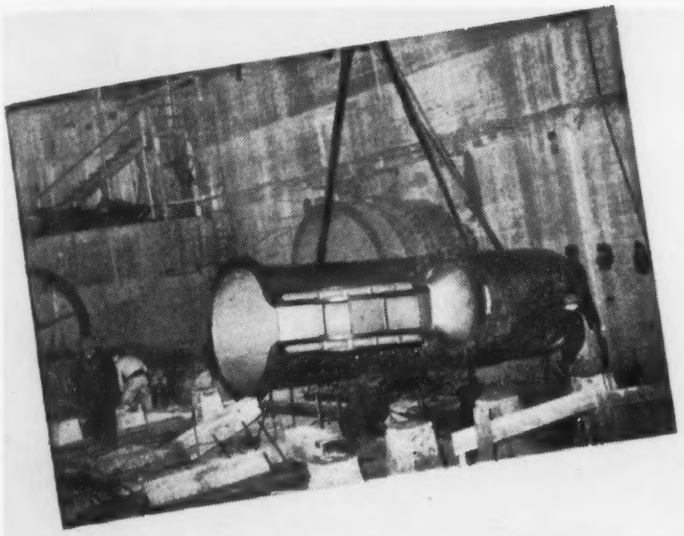
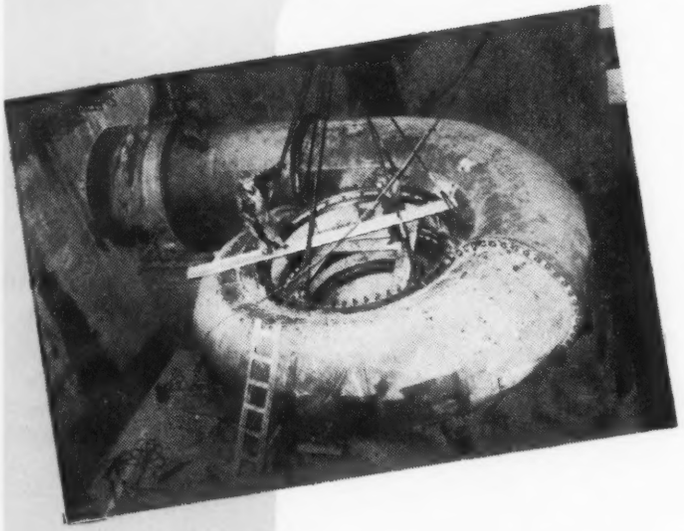
TRICO FUSE MFG. CO.
Fuses, Oilers, Clip Locks and Fuse Pullers

KNOX PORCELAIN CORP.
Electrical Porcelain





Three Views Show Installation of Scroll Casing for Pelton Reaction-Type Turbine.

Two More

PELTON Hydraulic *Turbines for* CITY of TACOMA

Each rated 34,500 Hp., 225 R.P.M., 273-Ft. Head, with 144-inch Diameter Main-inlet Butterfly Valve

These two Pelton Hydraulic Turbines are installed in the Alder Power House, City of Tacoma, Washington, on the Nisqually River which is fed by the melting snows of Mt. Rainier.

Pelton has designed and built hydraulic turbines and their water-control valves since 1880. Through reliability and improvements Pelton equipment has faithfully served utilities the world over and has contributed to "more electricity for less money."

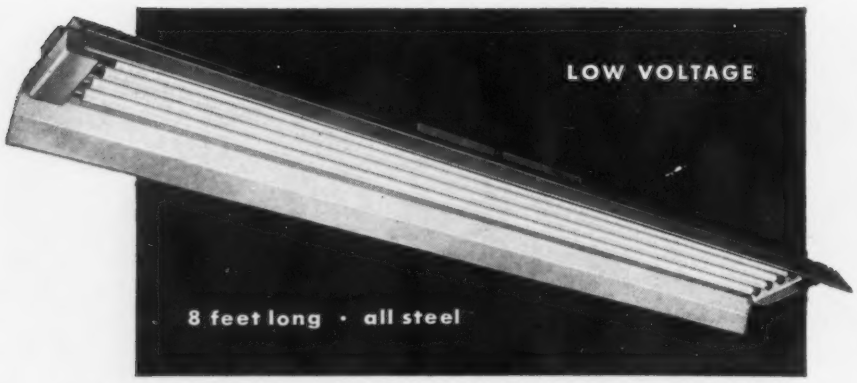
BLW THE BALDWIN GROUP

The PELTON WATER WHEEL Company

Subsidiary of The Baldwin Locomotive Works

2929 NINETEENTH STREET • SAN FRANCISCO 10, CALIFORNIA

*COLOVOLT COLD CATHODE INDUSTRIAL FIXTURES



Here is the new Colovolt industrial fixture, one of a complete line of industrial and commercial "packaged" units. Equipped with the standard 93" Colovolt 10,000 hour lamp, Colovolt fixtures may be used singly or in continuous line lighting in multiples of 8 feet. Instantaneous starting, no flickering, guaranteed for 1 year except for failure due to breakage are extra advantages of the Colovolt Cold Cathode low voltage fluorescent lamp. The long life expectancy of Colovolt lamps may be realized even when constantly turned on and off, and *pre-scheduled re-lamping, with no loss of production or time, is now possible with Colovolt installations.*

*Trade mark registered U. S. Pat. Off.

Contact your electrical wholesaler or jobber, or write us for full details and prices.

General LUMINESCENT CORPORATION

GENERAL LUMINESCENT CORPORATION

670 S. FEDERAL STREET CHICAGO 5, ILLINOIS

there's a DRIVER-HARRIS ALLOY for Every Electrical Resistance Requirement

NICHROME® & NICHROME V for winding large value resistors where space factors call for compactness in design without sacrificing dependability. Available in all shapes and sizes drawn down to the extremely fine gauge of .001" diameter—67 miles to the pound.

Also the time-tested standard alloys for all vitreous enamel resistor requirements due to the complete absence of occluded gases. NICHROME V is particularly recommended when a more constant resistance at variable temperatures is specified.

ADVANCE® for winding precision resistors used in electric meters and laboratory testing devices. In finer sizes its negligible temperature co-efficient of resistance (±.00002) combined with high resistivity makes it the most desired alloy for this use.

MANGANIN for precision bobbins, Wheatstone Bridges, Decade Resistance Boxes, Potentiometers and National Bureau of Standards type resistance standards which require fixed stability and constant resistance under normally variable operating conditions and negligible thermal e.m.f. against copper.

In addition to these we manufacture over 80 different electrical heat and corrosion-resistant alloys. If your resistance requirements are different tell us about them and depend on it . . . Driver-Harris will develop the alloy best suited to your specifications.

Driver-Harris COMPANY

Stocked for the Coast Trade at: ANGUS-CAMPBELL, INC.

235-241 San Bruno Ave., San Francisco • 449 So. San Pedro St., Los Angeles • 2122-4th Ave., Seattle

Main Office and Plant: HARRISON, NEW JERSEY

Trade Mark Reg. U.S. Pat. off.

UTILITY PROGRAM RATES TOP HONORS FROM RADIO EDITORS

San Diego Gas and Electric Co.'s radio program, *GI Joe—Civilian,* has been given top honors by a vote of California radio editors, according to a poll made by Billboard Magazine. This program, which deals exclusively with the rights and problems of returned veterans, has been selected as the most outstanding community service program in the southern area.

Originated in February 1945, by Forrest M. Raymond, advertising manager of San Diego Gas and Electric, the weekly half-hour show airs the problems of returning veterans and endeavors to secure for them professional advice from proper authorities. Each broadcast, over Don Lee's San Diego station KGR, features three returned GI's and three experts.

In the beginning the program dealt almost entirely with veterans' questions about the GI Bill of Rights, and included such timely subjects as college educations, insurance reconversion, vocational training, apprenticeship programs, pensions, disabilities and hospitalization. The subject of business loans and housing provided material for many lively programs. At the present time the show is being used to secure jobs for vets.

● RE-ELECTED officers of the New Mexico Rural Electrification Cooperative Assn. include Oliver Kimbrough, Clovis, president; Gaylord Bert, Taos, vice-president; C. O. Shirley, Portales, secretary-treasurer, and Otto Wood, Artesia, director. Norton Davis of Springer Electric Cooperative was named to the board of directors.

● SOUTHERN CALIFORNIA EDISON has been granted a 50-year franchise to operate in Kern County, Calif., by the board of supervisors. The franchise was approved in spite of rural opposition which claimed the long term would endanger the development of the Central Valley project by the Bureau of Reclamation. Under terms of the agreement the utility will pay the county 2% of the annual gross.

● IMPROVEMENTS in the Richfield, Utah, area have been announced by Telluride Power Co., involving expenditures of about $150,000. Listed as projects are a 1,500-kw. substation, service shop and warehouse at Richfield and a substation and switching facilities at Milford.

● SPECIFICATIONS are now being prepared and bids will be sought in about 60 days by the City of Burbank, Calif., for construction of a $2,000,000, 20,000-kw. steam electric power plant.

FOR SAFETY'S SAKE . . . USE CONDUIT *(Full Weight Rigid Steel)*

It's time to insist on SAFE wiring again

NOT so long ago, material shortages and other emergency demands forced practices on the electrical industry that did not meet code requirements. For example, people got temporary permission to use open wiring, and other less-than-safe systems.

Now that the emergency is past, common sense dictates a return to safe practice. Temporary wiring should be replaced. In new construction, only the best methods should be followed--and in electrical construction "best" means "safest."

REMEMBER that the only wiring system approved by the National Electrical Code as moisture, vapor, dust and explosion proof in hazardous locations is a standard-threaded rigid conduit.

Youngstown's "Buckeye" is the most widely used full-weight, rigid-steel conduit in the world. It is stocked and sold by leading electrical distributors in every industrial market. Specify "Buckeye" and be safe.

BUCKEYE YOUNGSTOWN CONDUIT

YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

GENERAL OFFICES - YOUNGSTOWN 1, OHIO

Export Offices - 500 Fifth Avenue, New York City

Manufacturers of

CARBON - ALLOY AND YOLOY STEELS

Ask your distributor for:
Youngstown Buckeye Conduit. Pipe and Tubular Products. Sheets. Plates. Electrolytic Tin Plate. Coke Tin Plate. Bars. Rods. Wire. Tie Plates and Spikes.

insulation for a JUKE BOX

is not at all unusual considering the manifold connecting wires often needed.

One manufacturer wanted a special type for their machines; an eight wire, parallel conductor that could be used unobtrusively along a wall like a tape, but could be separated easily to make coin box connections. The insulation was to be in a variety of colors to match wall or trim paint.

The project was engineered, dies made, and ready for production within a matter of weeks.

YOUR unusual insulated wire requirements may be far different from those of a juke-box manufacturer, but they will be afforded the same benefit of our experience in thermoplastic insulating materials.

A letter outlining your particular problem will be all that is necessary to set into motion our engineering and experimental unit.

Write Today!

•

RESINITE insulating tapes and tubing in stock sizes.

Send for booklet showing complete listings.

RESIN INDUSTRIES
SANTA BARBARA · CALIF

RESEARCH FOUNDATION RESUMES PROGRAM

Resuming activities greatly curtailed during the war, the Agricultural Engineering Research Foundation of Corvallis, Ore., met in Portland recently to elect officers and approve a program of research to be put into operation this summer. All the present officers were re-elected as follows: R. V. Stockton, rancher of Sheridan, Ore., president; W. A. Schoenfeld, director of the Experiment Station and dean of the College of Agriculture, Oregon State College, Corvallis, vice-president; R. S. Besse, assistant director of Experiment Station, Corvallis, secretary; and Berkeley Snow, executive secretary of the Northwest Electric Light & Power Assn., Portland, treasurer. F. E. Price, assistant dean of College of Agriculture, Corvallis, will continue as project director of the foundation.

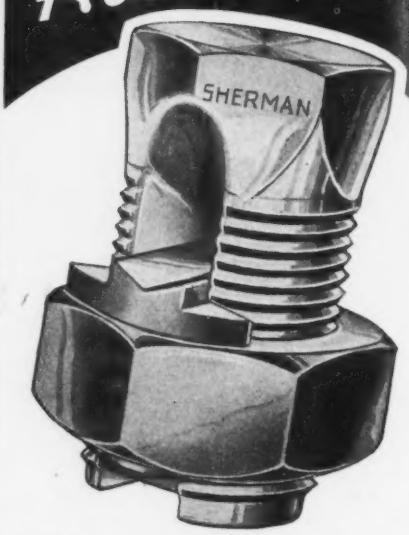
With its research program getting into full swing next July, the foundation will enter its thirteenth year. It was organized in 1934 by farmers, Oregon State College people, electric utility companies, and manufacturers of farm equipment in Oregon, to conduct research on the uses of electricity in agriculture for larger and better crops and for economy of farm operation. Among the more spectacular of its accomplishments in the past years has been the working out of the mechanics and the economic proving of sprinkler irrigation in its many applications in the state of Oregon. Among projects for continuing study are barn hay curing and the drying and storage of bulbs.

Elected trustees at the Portland meeting were George T. Bragg, Pacific Power & Light Co., Portland; F. W. Brownell, poultry rancher, Milwaukie; A. C. McMicken, Portland General Electric Co., Portland; Wade Newbegin, R. M. Wade Co., Portland; William A. Schoenfeld, Oregon State College, Corvallis; R. V. Stockton, rancher, Sheridan; Robert Warrens, farmer, Forest Grove.

● CONSTRUCTION has been started on two new office buildings at Portland for the Bonneville Power Administration. The buildings, two-story and of concrete construction, will be adjacent to Bonneville's present administration building, and will cost approximately $300,000 each. They will provide 70,000 sq. ft. of space.

● PURCHASE by the B. C. Electric of property on Douglas St. between Pandora and Cormorant has been announced. The $80,000 property includes the site of the company's Douglas St. store and a number of other offices and stores.

Again Available!



Sherman High Strength Bronze Service Connectors

It's a pleasure to announce that we are again stocking and shipping these fine quality Sherman Split Bolt Connectors that are so universally liked.

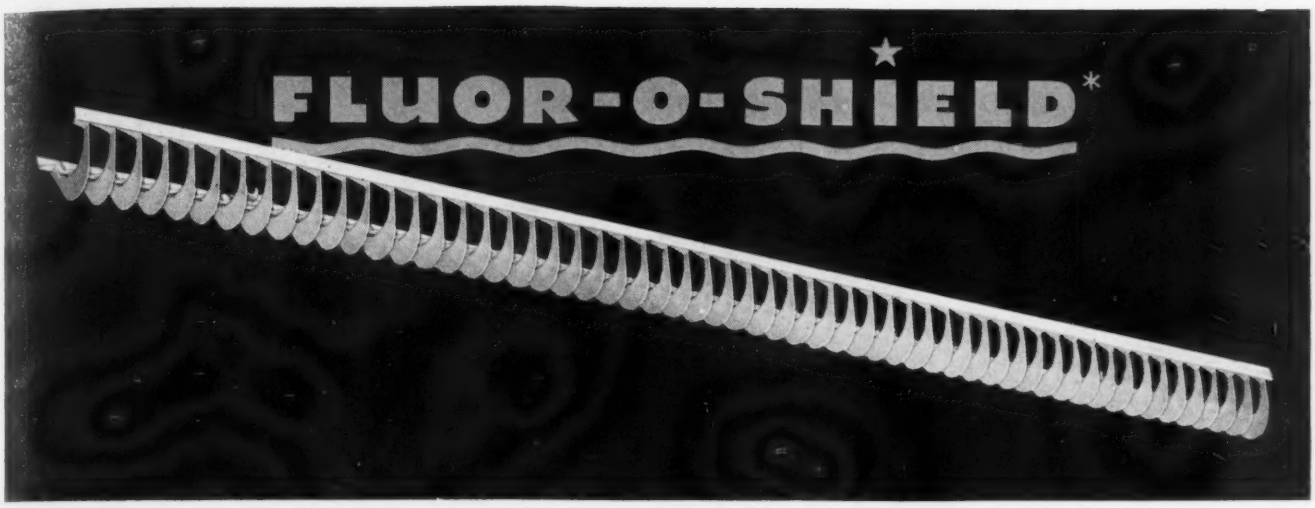
Sherman Connectors are made from silicon bronze averaging more than 90,000 lb. tensile strength per square inch. Threads on the body are not pressed or stamped, but are die cut and checked with precision gauges to mate perfectly with the tapped threads in the nut.

All connectors have full hex heads and nuts are extra thick. The solid, reinforced spacers provide maximum bearing surface on the wire and nut. Extra long pilot, for easy assembly.

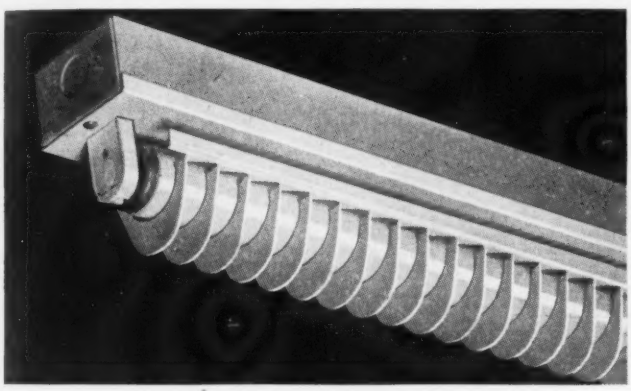
Extra Length connectors available for three wires.

Write today for Trade Bulletin 22 giving full data!

H. B. Sherman MFG. CO.
BATTLE CREEK, MICHIGAN



Fluor-O-Shield is made of durable lightweight aluminum, finished in white baked enamel.



No glare—greater efficiency. Casts no shadows.

Instantly attached without bolts, screws or tools.

FLUOR-O-SHIELD*

light diffuser for fluorescent lamps

- Snap-on clips permit instant attachment or removal.
- Fits open-face fluorescent lamp fixtures.
- Eliminates glare, minimizes stroboscopic effect, reduces eyestrain.
- Readily adaptable for office, factory, store, school and home fluorescent lighting.

*Trade Mark—Patent Pending

SPECIFICATIONS

Catalog Number	Length	Fits Lamp	Units per Pkg.
27-1-40	46⅞ in.	40 watt	12
27-5-40	22⅞ in.	20 watt	12

Couple the advantages of fluorescent lighting with the practical utility of Fluor-O-Shield—the simple one-piece louver that diffuses light evenly, prevents glare, reduces eyestrain. More efficient work, more sales, and improved lighting for store displays, production lines and office layouts are immediately possible with inexpensive Fluor-O-Shields. No trick to change burned-out lamps—Fluor-O-Shields simply snap on and off. Lightweight—cause no stress or strain on lamps or sockets. Equally suitable for continuous or unit mounting.

$ALES-WISE DEALERS: Step into a quick, profitable business selling Fluor-O-Shields as a multiple item with fluorescent lamps and starter replacements. Fluor-O-Shields are easy to stock, nest to take little space and move out rapidly. Remember — practically every user of fluorescent lighting is a prospective Fluor-O-Shield customer.

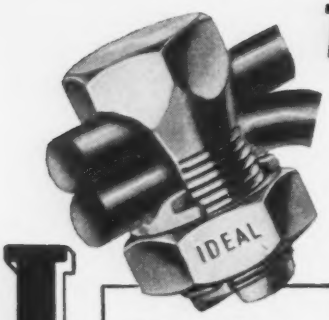
Available in two sizes for 40 and 20 watt lamps. Prompt delivery. If your distributor does not have Fluor-O-Shields, ask him to write:

$1.95 40 watt 46⅞ inch Retail list price

$1.25 20 watt 22⅞ inch Retail list price

FLUOR-O-SHIELD*

CAMFIELD MANUFACTURING COMPANY
Grand Haven, Michigan



They're NEW!

IDEAL

SPLIT BOLT CONNECTORS

For making permanent or temporary solderless connections of wire and cable. Precision—made of high quality bronze, brass or aluminum. Two types "one piece" or "two piece" with small or large heads. On "one piece" types a flexible link permits universal movement of nut, which swings clear of slot, eliminating interference with wires during installation. No burrs, ends or sharp edges. All Sizes.

SERVICE ENTRANCE CONNECTORS also available.

OTHER IDEAL WIRING DEVICES

- —"Wire-Nuts"—Modern solderless, tapeless wire connectors.
- —"E-Z" Wire Strippers—Hand operated—2 Models "Standard" and "Automatic"
- —Fish Tape, Reel and Puller—3 Tools in 1—makes fishing easy. No tape breakage
- —Lugs (solder and solderless) All Sizes
- —Joist Boring Machine—Bores up to 11 ft. above or below floor level

SOLD THROUGH JOBBERS

PROMPT DELIVERY

Wiring Device Division

IDEAL INDUSTRIES, Inc.

(Successor to Ideal Commutator Dresser Co.) 1643

WEST COAST WAREHOUSE STOCKS:
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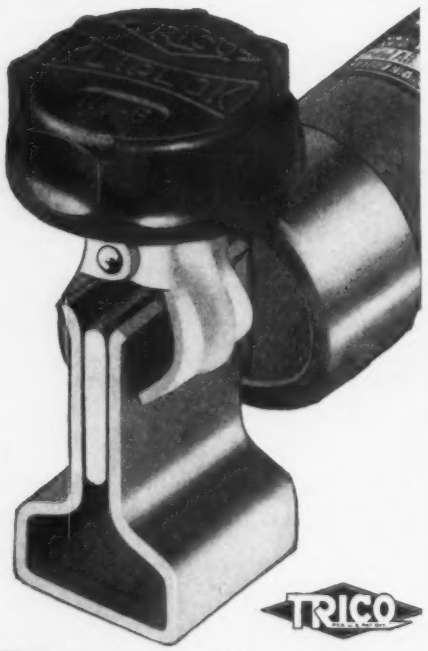
Sales Offices in all Principal Cities

KLIPLOK

supplies the needed

PRESSURE That STAYS ..and PAYS



There's no chance for faulty contact between fuses and clips when TRICO KLIPLOK CLAMPS are applied.

The vise-like pressure locks them together—your insurance against premature fuse blowings—unnecessary shutdowns, wasted current—fire and accident hazards.

Order from your Jobber, or write for Bulletin No. 6-A

TEST CLAMPS

A heavy duty clamp that carries extremely heavy currents and "stays put" when attached. Used for temporary connections, for motor and meter testing, jumpers, etc.

Made in 7 sizes—0 to 300 amperes.

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H. H. Van Luven - - - - - - Los Angeles
Hughson & Merton - - - - - San Francisco
Albert S. Knight - - - - - - - - Seattle
W. E. Young Co. - - - - - - - - Denver

TRICO FUSE MFG. CO. Milwaukee, Wisconsin

PEOPLE

made this news

● DR. A. E. GAUER has been appointed president of the B. C. Electric Railway Co., succeeding W. G. MURRIN, who resigned at the annual meeting of the company on April 25. Youngest president in the history of the company, Dr. Gauer was graduated from the University of British Columbia and took his Ph.D. in economics and political science at the University of California. As a Rhodes Scholar from Vancouver, he received a jurisprudence degree at Oxford. He has practiced law, been on the faculty of the University of Toronto, and has made tax and social welfare studies. He was for a year expert on social welfare, social insurance and labor legislation for the Royal Commission on Dominion and Provincial Relations. From mid-1931 until his appointment as vice-president of the B. C. Corp., he was general secretary of the B. C. Electric Railway Co. His work dealt particularly with public commission data and with rate and wage hearings.

● W. G. MURRIN, who retires as president of B. C. Electric, was born in London and started his career with the City of London Electric Lighting Co. In 1913 he moved to British Columbia and successively held the posts of mechanical superintendent, general superintendent, assistant general manager and vice-president of B. C. Electric. He was appointed president of the company on Jan. 1, 1929.

● JACK M. FENTON, former Westerner, has been made manager of the department store division of Bendix Home Appliances. Fenton formerly managed department stores sales for Westinghouse Supply in San Francisco and at one time was sales counsellor for the George Belsey Co., Los Angeles distributor. He also was with Sunset Electric Co. in Seattle for a time.

● GENERAL ELECTRIC CO. has announced appointment of GLEN H. HARKER as appliances sales manager in Los Angeles and of FRED K. HAGAR as Salt Lake City appliances sales manager. Harker has been heating device and clock specialist in San Francisco and Hagar was transferred from G-E Supply in Omaha.

● ROBERT H. GERDES succeeds THOMAS J. STRAUB as general counsel for Pacific Gas and Electric Co. Straub, company attorney for 35 years, has been named special counsel.

● JAMES T. COATSWORTH, former sales promotion manager of the Public Service Co. of Colorado, on April 1 became commercial director of Edison Electric Institute, succeeding C. Ernest Greenwood, retired. Coatsworth joined Public Service of Colorado in the accounting department, was in the gas house heating division, then in the street lighting department and in 1934 supervised the construction of the company's Electric Institute. He was made sales promotion manager for electric and gas in 1938.

● THOMAS CHAMBERS has been appointed by the British Columbia Electric Railway Co. Ltd. as executive assistant to J. Lorn McLean, vice-president and chief financial officer for the company. Chambers has been general auditor for the Dominion Rubber Co. at Montreal since 1942, and prior to that he was an accountant at Edmonton, Calgary, Winnipeg and Lethbridge.

● W. C. MAINWARING, B. C. Electric vice-president, was honored by members of the Electric Service League of British Columbia, when tribute was paid to his work in behalf of the industry in Vancouver. Speakers at the luncheon meeting included British Columbia leaders of the industry.

● L. H. SOARE was appointed superintendent of the City of Oakland Electrical Department, succeeding Ben C. Hill, who retired after 34 years service. Soare has been with the department 18 years in the telephone and electrical signal department as supervisor.

● DR. WILLIAM E. WICKENDEN, head of the Case School of Applied Science, Cleveland, and national president of the AIEE, toured the West last month, speaking before engineering and allied groups.

● H. M. HITT, former district service manager for the General Electric Supply Corp. at San Francisco, has been promoted to manager of radio sales. J. B. BAKER takes his place as service manager.

● JOHN E. DUGAN, industrial service consultant and commercial cooking specialist, has been appointed commercial utilization representative for the Bonneville Power Administration.

● J. C. HENKLE was recently made general superintendent of Portland General Electric Co. He replaces C. P. OSBORNE, who has retired.

GET FIVE TIMES MORE SERVICE

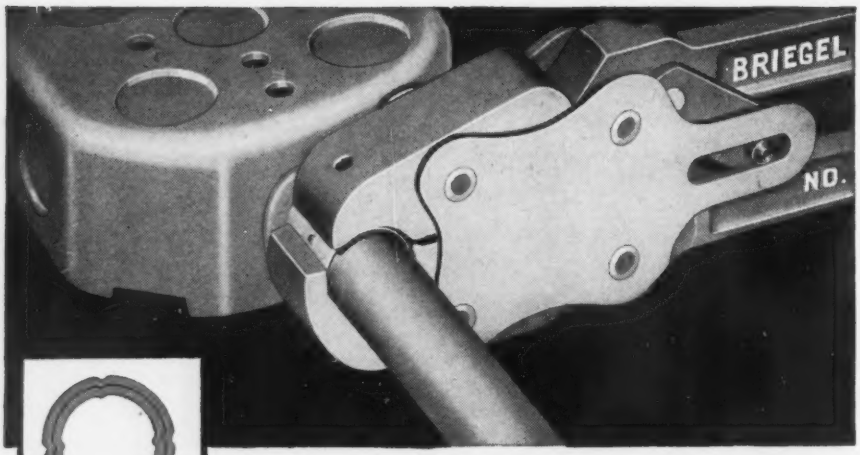
WITH Watch Dog REG U.S. PAT OFF STARTERS

G-E Watch Dogs are not only designed to start fluorescent lamps properly, but they are also equipped to stop them properly. When lamps die, the Watch Dog promptly cuts out of the circuit. This action prevents dead lamp flickering and protects the ballast against overheating. It also conserves the life of the starter, since the starter does not wear itself out attempting to re-light a deactivated lamp. This is the reason why one Watch Dog will outlast five ordinary starters, and why you get five times more service with this starter.

Maintenance becomes a vastly simplified job when Watch Dogs are installed. Because of their long life, starter replacements naturally are fewer. Preparing a fixture for renewed operation is reduced to the simple task of pressing the starter's reset button before relamping.

For additional details on Watch Dogs and other accessories in the complete G-E line, write for our free catalog. Address request to Section G563-18, Appliance and Merchandise Department, General Electric Company, Bridgeport, Conn.

GENERAL ELECTRIC



Cross section Showing Indentations.

E·M·T·UP THE QUICK WAY
Two Squeezes and it's Set

TWO QUICK SQUEEZES give you Finer, Faster Conduit Connections. B-M Fittings do away with the twisting, turning and tightening of nuts and save you valuable time and materials. Then too, they are stronger, neater and much easier to work with in tight places. Start using B-M Fittings today. Have more satisfied customers—more profits from each job!
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WITH BIG FEATURES

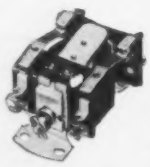
The Bulletin 104 Relay is small, yes . . . but small only in size. It will do a big job for you . . . and right where a larger relay would be hard to get in.

Large wiping contacts that carry heavy loads . . . heavy contact pressures to reduce arcing and sparking . . . wide range of voltages for both D. C. and A. C.

These are but a few of the big features of the little 104 Relay . . . the relay designed to meet your heavy duty requirements where weight and space are prime factors.

Write for Bulletin 104 today.

VARIOUS ARRANGEMENTS
Bulletin No. 104 Relays are available in Single and Double Pole, Single and Double Throw, and with or without an auxiliary contact; with fixed, flexible or adjustable contacts, with Bakelite or Radio Frequency insulation.



WARD LEONARD
RELAYS • RESISTORS • RHEOSTATS
Electric control devices since 1892

WARD LEONARD ELECTRIC CO., 68 SOUTH ST., MOUNT VERNON, N.Y.
OFFICES IN PRINCIPAL CITIES

● T. R. HEIKES, former superintendent of the American Falls plant of the Idaho Power Co., has been transferred to Boise, where he will be supervisor of power plant operation and maintenance. L. E. GARLINGHOUSE, formerly superintendent at the Swan Falls plant, succeeds Heikes at American Falls.

● CLAUDE L. DRAPER has been confirmed for membership on the Federal Power Commission by a unanimous Senate vote. He has been a member of the commission since it was organized in 1930 and preceded his FPC service with years of membership on the Wyoming commission.

● J. M. BOURUS was elected vice-president and treasurer of the San Diego Gas & Electric Co. at a recent meeting of the board. With the company since 1918, he has been treasurer since the retirement of M. B. Fowler, in May 1945.

● JOE VIVIAN has taken over the duties of electrical and maintenance engineer for Southern California Edison, following retirement of William R. Frampton. Vivian's former job of protection engineer is being filled by COURT LOWERISON.

● RETURNING to Central Arizona Light & Power after war service were LT. COL. LEE POE, who is back as superintendent of the electric department, and LT. F. T. FAHLEN Jr. (USN) who has returned as supervisor of all district offices.

● M. O. BEST, Phoenix, has been elected chairman of the board of Central Arizona Light and Power.

● GEORGE C. TANTY, formerly with Crosley on the Pacific Coast, has been made southwest sales manager.

Deaths

● J. W. CUNNINGHAM, a director of Idaho Power Co., died in Boise on March 30 at the age of 88. He was an incorporator in 1887 of the Capital Electric Light, Motor & Gas Co. that constructed the first electric generating plant in Idaho and initiated electric service in Boise.

● JOHN A. HENNING, public utilities superintendent at Lodi, Calif., died April 15. He was 71 years of age. Superintendent of Lodi Municipal District since 1910, the year in which it was founded, Mr. Henning also had been active in the California Municipal Utilities Assn.

TRADE notes

● EXPANSION of its Western district electronics department and three appointments in that field were announced last month by General Electric Co. Walter J. Fitzpatrick has been appointed tube and specialty representative for the Los Angeles electronics department. Noel L. Keefer was promoted to transmitter service representative, Los Angeles. Byron S. Wells was made receiver representative for Washington and Oregon with headquarters in Seattle. Wells formerly was at Salt Lake City and he will continue to serve that district as receiver tube and specialty representative.

● CLYDE GARWOOD JR. has been appointed by Westinghouse Electric Corp. and Westinghouse Supply as representative in Los Angeles and San Diego for electrical appartus, supplies and appliances for apartment house and multiple dwelling builders, owners and operators. He will contact architects, engineers, electrical and building contractors, utilities and financial institutions involved. D. C. Pence, Westinghouse Supply district sales manager, will coordinate Garwood's activities in matters involving the supply company.

● WILLIAM P. HORN CO., manufacturers' representative, has announced recent appointments. S. Allen Laitner is the new Los Angeles branch manager, with sales office at 2806 W. Seventh St. Arnold Maizels is branch manager of the Northwest office in the Portland Merchandise Mart. Bernhard L. Stone has joined the company's San Francisco office in the Western Merchandise Mart. In its fiftieth year of operation, the company represents manufacturers of table appliances, heaters, chimes, electrically operated tools, etc.

● C. E. SMOOT JR., who recently helped clean up the Japanese situation on Saipan and Okinawa with the U. S. Marines, has returned to civilian life. He is in charge of the Seattle branch of the Smoot-Holman Co., Western lighting equipment manufacturers, at 209 Seneca St.

● WILLIAM S. GORHAM has been made sales engineer in the Ilg Electric Ventilating Co.'s Los Angeles office. Gorham had been with the Lockheed engineering department before joining Ilg.

THE LINE OF
LEAST SALES RESISTANCE

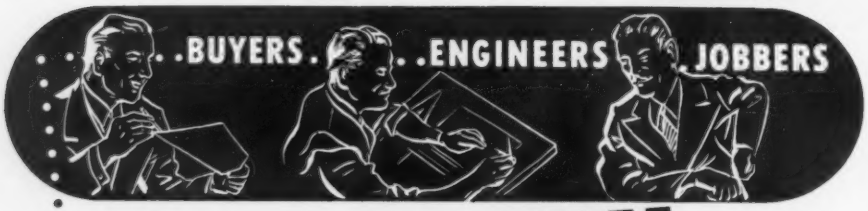
ROYAL-NOARK
Non-Renewable
CARTRIDGE FUSES

ROYAL WIRE

ROYAL *"Crystal"*
The ORIGINAL
GLASS-TOP FUSE

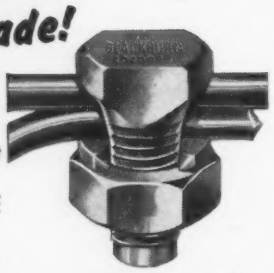
ROYAL
Quality WIRE • CORD SETS
CARTRIDGE and PLUG FUSES • FUSTATS
TROUBE LIGHTS • CHRISTMAS LIGHTING SETS
ROYAL ELECTRIC CO., Inc., PAWTUCKET, R. I.

WITH THE MEN WHO KNOW



It's BLACKBURN

The Most DURABLE Connector Made!



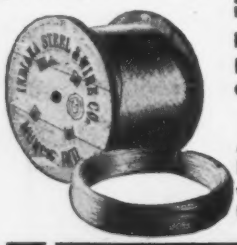
They're first choice of men who know—Engineers, Buyers, Jobbers, because they've proved to be the most durable connector made. That's because they're the only complete line of connectors made of DURONZE — the alloy that's 75% stronger than hard copper or commercial bronze. Hence, BLACKBURN Hi-Strength Connectors will not distort, are trouble-free on the line, and may be used over and over. They cut maintenance costs! *It pays to use a QUALITY Product!*

Over 100 Conveniently-Located Jobbers' Stocks

BLACKBURN *Hi-Strength* **CONNECTORS**

Jasper Blackburn
PRODUCTS CORP.
First, Madison & Clinton Sts.
ST. LOUIS 6, MO.

ALL the strength and durability inherent in steel are combined---with definite economies---in *Crapo* Galvanized Steel Strand. Heavy, ductile, tightly-bonded zinc coatings, applied by the famous *Crapo* Galvanizing Process, provide lasting protection against corrosion.



Ask the distributor of *Crapo* Galvanized Products near you or write direct for further information!

INDIANA STEEL & WIRE CO.
MUNCIE, INDIANA

"WHAT CAN IT DO FOR ME?"

Advertising that is read with this thought in mind my provide the solution to a problem that has kept you awake nights.

We all know "It Pays To Advertise." It pays just as big to investigate WHAT IS ADVERTISED—every month in ELECTRICAL WEST

TORK CLOCKS

THE POPULAR TIME SWITCH LINE KNOWN EVERYWHERE

There is a Tork Clock for every regular switching job: 60 minute, 4 hour or daily cycles.

Bulletins on request

THE TORK CLOCK CO., Inc.
MOUNT VERNON, N. Y.

Western Representatives
L. H. Veale, 445 E. 3rd St.....Los Angeles
Geo. H. Curtiss, 540 McAllister St.....S .F.
H. M. Sayers, 1101 Eastlake Ave.....Seattle
Stevens Sales Co., 41 P.O. Place, Salt Lake
Felix Simon, P.O. Box 614.....Denver
H. Geo. Shefler, P.O. Box 1587.....Phoenix

● In Reporting incorporation of the J. E. Redmond Supply Co. at Phoenix (March, p. 115) Electrical West erred in stating that the company would handle installations. This corporation, developed from the J. E. Redmond Co., manufacturers' agent since 1928, is a wholesaler of electrical construction material and household appliances and is not interested in installation of equipment. J. E. Redmond is president and James T. Deppe is secretary-treasurer of the new firm, which will deal in all types of electrical material, including deep-well pumps, transformers, poles, meters, conduits, wiring, lamps, fixtures and street lighting equipment. Distribution is state-wide.

● Articles of incorporation have been filed for the formation of the Tubbs Electric Co., at Spokane, with a capitalization of $50,000. Clarence A. Tubbs, recently vice-president of the Columbia Electric and Mfg. Co., and for 22 years in the electrical and appliance business, will be president of the new company. The firm has leased a three-story building at S 165 Post St. for wholesale distribution of electric supplies, radio parts and equipment, major and small appliances.

● The Appliance Departments of Bruener Co. in Oakland, according to Dick Hurf, appliance manager, will share in the general remodeling and refurnishing going on in the Bruener stores in seven locations in northern California. Cut down to a minimum size during the wartime shortage of appliances, the departments will be remodeled and contain kitchens and laundries from which spectacular promotions can be staged.

● Gough and Co. Ltd., is now installed in its new premises at 569 Beatty St., Vancouver, B. C. This wholesale electrical equipment firm has closed down its premises at 27 West Pender St., which it has occupied for the past 18 years and is carrying on all its activities from the new building. J. Johnston is manager of the appliances division of the company and A. MacDonald is manager of the general merchandise section.

● Robert D. Halverson, former star salesman for the San Diego Gas and Electric Co., has opened an attractive modern store at 7880 Girard Ave., La Jolla, Calif. Included in Halverson's lines are Westinghouse refrigerators, ranges, and automatic washers; Maytag and Horton washing machines; Magic Chef and O'Keefe and Merritt gas ranges; Farnsworth and Spartan radios, and the Deepfreeze line.

● THOMPSON-HOLMES Ltd., distributors of electrical appliances and housewares, will move the headquarters of its company and its sales department to the Western Merchandise Mart April 1, occupying the space formerly used by Stromberg-Carlson, on the fourth floor. The accounting office will also be moved there until a new building at 650 2nd St. is completed within three months or so. Then the accounting department will move to this building, where enlarged warehouse facilities will be provided. Sales headquarters, however, will remain at the Mart.

● GEORGE E. GARTHORNE, electrical engineer, has joined G. M. Richards and Associates, consulting engineers, at 333 Kearney St., San Francisco. Garthorne, known for design, installation and operation of a number of very large electrical jobs in California and the West, entered the Richards firm recently, when Edwin W. Wismer took over the electrical contracting business of William Camp in Sacramento, which is now known as Cates & Wismer. Cates was formerly with Westinghouse.

● HAMILTON MFG. Co. has appointed distributors for its automatic clothes drier, including in the West: Alford's Wholesale, Albuquerque, N. M.; Northwest Supply Co., Butte, Great Falls and Helena, Mont.; The Auto Equipment Co., Denver; Sues-Young Co., Los Angeles; Gordon E. Wilkins Inc., Phoenix, Ariz. and Salt Lake City; F. B. Connelly Co., Portland and Seattle; California Electric Supply Co., San Francisco; Columbia Electric & Mfg. Co., Spokane.

● CLIFF WALK, returned from the Navy, has affiliated with Frank P. Nibley to form the firm of Nibley & Walk, 340 Pine St., San Francisco, handling electrical specialties, lighting fixtures, refrigerators, radio sets, in the northern California, Nevada and Utah territory. Walk was formerly with Westinghouse Lamp division before entering the Navy.

● COLONIAL RADIO Corp. of Buffalo, N. Y., wholly owned subsidiary of Sylvania Electric Products Inc., is building an assembly plant at Riverside, Calif. Home radio receivers for West Coast distribution will be assembled at the new plant, according to E. C. Culliton, Colonial engineer.

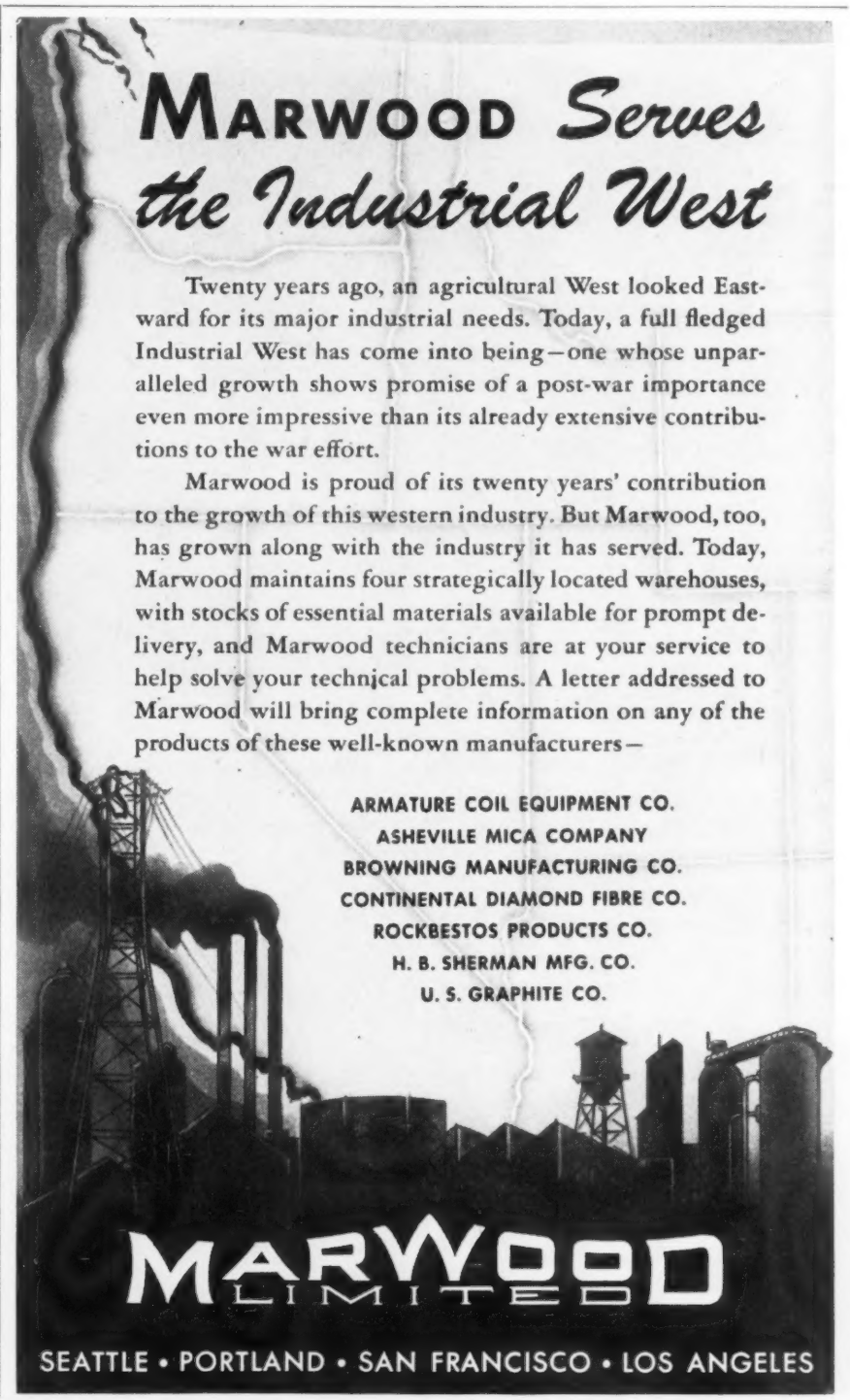
● LYNN & CHEMNITZ, manufacturers' representatives, recently moved from 316 Commercial St. to the Chamber of Commerce Bldg., 1159 S. Broadway, Los Angeles.

● SMALLCOMB ELECTRIC Co., 1120 S. Main St., Los Angeles, recently purchased a 60-ft. frontage just south of its present building for future expansion and drive-in delivery service. Larger shop facilities will be provided also. A 32-ft. lot directly north has also been purchased for parking facilities for customers and salesmen. Smallcomb Electric carries nearly $100,000 in stock of new air moving equipment which it sells through wholesale and retail channels. It does not install equipment itself.

● L. W. THOMPSON has been appointed southern California and Arizona representative for Automatic Control Co., specialists in liquid level control.

● GEORGE M. DOUMA has been appointed Western district sales manager for National Enameling and Stamping Co., makers of Nesco roasters. His offices will be in the Western Merchandise Mart, San Francisco, and his territory will include the eleven Western states.

● NEW ADDRESS of Lavenson and Savasta, manufacturers' representative at San Francisco, is 1208 Howard St.


MARWOOD Serves the Industrial West
Twenty years ago, an agricultural West looked Eastward for its major industrial needs. Today, a full fledged Industrial West has come into being—one whose unparalleled growth shows promise of a post-war importance even more impressive than its already extensive contributions to the war effort.
Marwood is proud of its twenty years' contribution to the growth of this western industry. But Marwood, too, has grown along with the industry it has served. Today, Marwood maintains four strategically located warehouses, with stocks of essential materials available for prompt delivery, and Marwood technicians are at your service to help solve your technical problems. A letter addressed to Marwood will bring complete information on any of the products of these well-known manufacturers—
ARMATURE COIL EQUIPMENT CO.
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PROFILES *of the month*

J. A. "Jake" Kahn, former Rocky Mountain manager for G-E Supply, at the industry luncheon honoring him in Salt Lake City. Attended by 200, the meeting was sponsored by the Intermountain Electric Assn. Kahn, for 30 years in the industry, resigned recently

Ferber R. Schleif, USBR electrical engineer at Grand Coulee Dam, was given a salary increase and $250 cash award for developing the instrument which permitted uninterrupted flow of electricity to the atomic bomb plant at Hanford, Wash., and other installations

Dr. Irving M. Langmuir (center) associate director of G-E's research laboratory, Schenectady, and 1932 winner of the Nobel Prize in chemistry, visited the West last month. He is pictured in San Francisco with F. Lowell Garrison (left), G-E advertising and publicity department representative, and Walter C. Smith, Pacific district engineering consultant for G-E and director of the Eighth District, AIEE

Ceremonies at San Diego Gas & Electric Co. last month celebrated the award of a War Department Certificate of Appreciation for Patriotic Services to E. D. Sherwin, company vice-president in charge of operations and assistant coordinator, South Pacific region, for the Utilities Wartime Aid program. In the picture below, Sherwin (right) is turning over the certificate to J. F. Sinnott (left), protection engineer; G. H. P. Dellmann, commercial sales engineer, and G. E. Jenner, engineer in charge of the transmission, distribution and design system

THE LINEMAN
Market Builder

He probably never thinks of it, but the Lineman, his "hooks" dug deep into the wood and his belt taut around the pole, is the man who opens up virgin fields for appliance and equipment sales. He is the trail blazer for new business, not only for his company but for manufacturers and distributors.

P. G. and E. linemen are now engaged on a far-reaching campaign of rural and suburban line extension that will add some 3000 miles to our distribution system and bring electricity to many thousands of homes that never have known the comforts and economy of its labor-saving service.

In Central and Northern California are 1,078,000 meters connected to P. G. and E. lines and the total is growing every month. Add to that fact the dependability and cheapness of P. G. and E. service and you have a Market that is a Market.

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

EW 18X-546

Sell Wiring First

Exaggerated, of course. Nevertheless, many home owners would be better prospects for electrical appliances if their homes were properly wired. One of the most important jobs today for the electrical industry (and that means *you*, too) is modernizing wiring in existing homes, and seeing that new houses are adequately wired when they are built. Every electrical outlet is a potential sales outlet for new appliances! Put adequate wiring first on *your* selling program.

PACIFIC COAST ELECTRICAL ASSOCIATION

601 W. FIFTH ST., LOS ANGELES 13, CALIFORNIA • 447 SUTTER ST., SAN FRANCISCO 8, CALIFORNIA